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NATIONAL PROGRAM OF INSPECTION OF NON-FEDERAL DAMS, TENNESSEE, --ETC(U)
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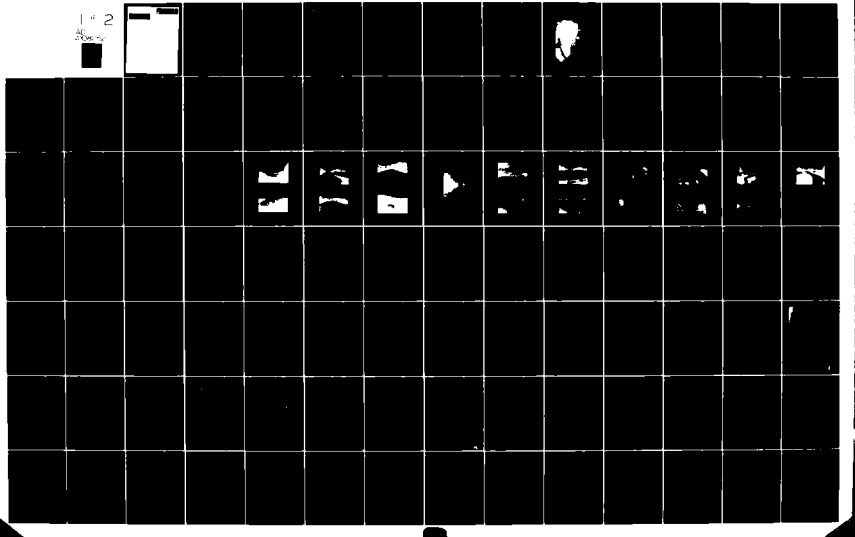

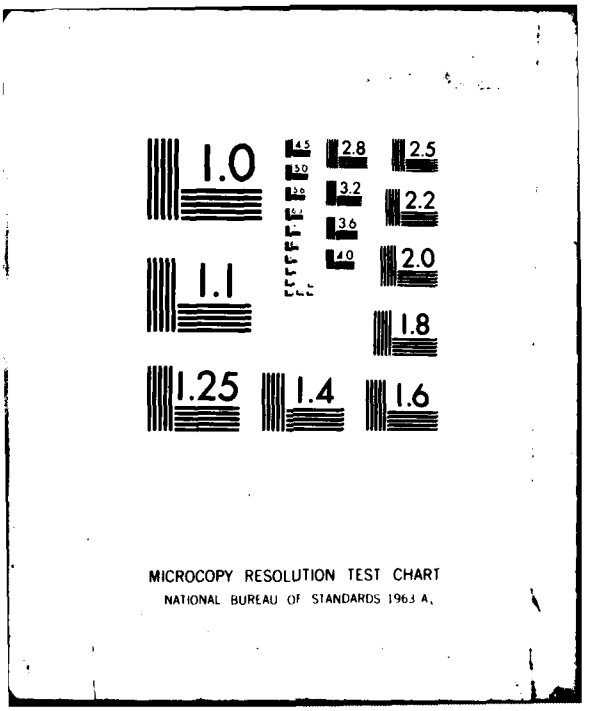
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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
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4. TITLE (and Subtitle) National Program of Inspection of Non-Federal Dams, Tennessee. Lambert Dam (Inventory Number TN 00901) near Six Mile, Tennessee, Blount County, TN., Little Tennessee River Basin		5. TYPE OF REPORT & PERIOD COVERED Phase 1 Investigation Report 6. PERFORMING ORG. REPORT NUMBER
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Dam Safety
National Dam Safety Program
Lambert Dam, TN
Six Mile, TN
Blount County, TN
Embankments
Visual Inspection
Structural Analysis

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Lambert Dam is a linear earthfill structure 605 feet long and 53 feet high with a crest width of 18 feet. The upstream and downstream slopes are 1V on 3.8H and 1V on 3.4H respectively. It has a capacity of 336 acre-feet at normal pool and 454 acre-feet at the top of the dam. The principal spillway consists of a 2.5 feet by 7.5 feet (ID) reinforced concrete riser which feeds a 30 inch diameter outlet pipe. Drawdown of the reservoir is controlled by a 24 inch square sliding headgate. The emergency spillway is an uncontrolled saddle type located just upstream of the right abutment. It runs parallel to the crest and

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is 117 feet in width. The embankment is well grassed and has no undesirable vegetation except for some 2 to 4 inch diameter pine trees located at the toe and left abutment tie in. No signs of sliding, cracking, differential settlement or erosion were observed on the dam or in the area immediately downstream. The dam is in the intermediate size and high potential category and should pass the Probable Maximum Flood (PMF). A hydraulic and hydrologic analysis reveals that during the PMF the dam will overtop by 1.3 feet for 4.75 hours. During the 1/2 PMF, the dam overtops by .65 feet for three hours. The embankment appears to be structurally stable; however, it is considered "significantly deficient" because the spillway is inadequate. It is recommended that a qualified engineer be engaged to develop project modifications that will allow the dam to pass the PMF and that the owner perform routine maintenance operations.

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202

IN REPLY REFER TO

21 SEP 1981

ORNED-G

Honorable Lamar Alexander
Governor of Tennessee
Nashville, TN 37219

Dear Governor Alexander:

Furnished herewith is the Phase I Investigation Report on Lambert Dam near Sixmile, Tennessee. The report was prepared under the authority and provisions of PL 92-367, the National Dam Inspection Act, dated 8 August 1972.

The report presents details of the field inspection, background information, technical analyses, findings, and recommendations for improving the condition of the dam.

Based upon the inspection and subsequent evaluation, Lambert Dam is classified as signi cantly deficient due to insufficient storage and spillway capacity to pass the probable maximum flood.

We do not consider this an emergency situation at this time, but the recommendation concerning project modifications to allow safe passage of the design flood and others contained in this report should be undertaken in the near future.

Public release of the report and initiation of public statements fall within your prerogative. However, under provisions of the Freedom of Information Act, the Corps of Engineers is required to respond fully to inquiries on information contained in the report and to make it accessible for review on request.

Your assistance in keeping me informed of any further developments will be appreciated.

Sincerely,

Kenneth W. Ashley, LTC
FOR LEE W. TUCKER
Colonel, Corps of Engineers
Commander

1 Incl
As stated

CF:
Mr. Robert A. Hunt, Director
Division of Water Resources
4721 Trousdale Drive
Nashville, TN 37220

PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM
TENNESSEE

Names of Dam ..... Lambert Dam
County ..... Blount
Stream ..... Tributary of Big Spring Branch
Date of Inspection ..... April 21, 1981

This investigation and evaluation was prepared by the Engineering Division of the Nashville District of the Corps of Engineers.

PREPARED BY:

Paul F. Bluhm
PAUL F. BLUHM
Civil Engineer

APPROVED BY:

Timothy McCleskey
TIM McCLESKEY
Chief I&I Section

TABLE OF CONTENTS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
TENNESSEE

Name of Dam:	Lambert Dam
County:	Blount
Stream:	Tributary of Big Spring Branch
Date of Inspection:	April 21, 1981

ABSTRACT

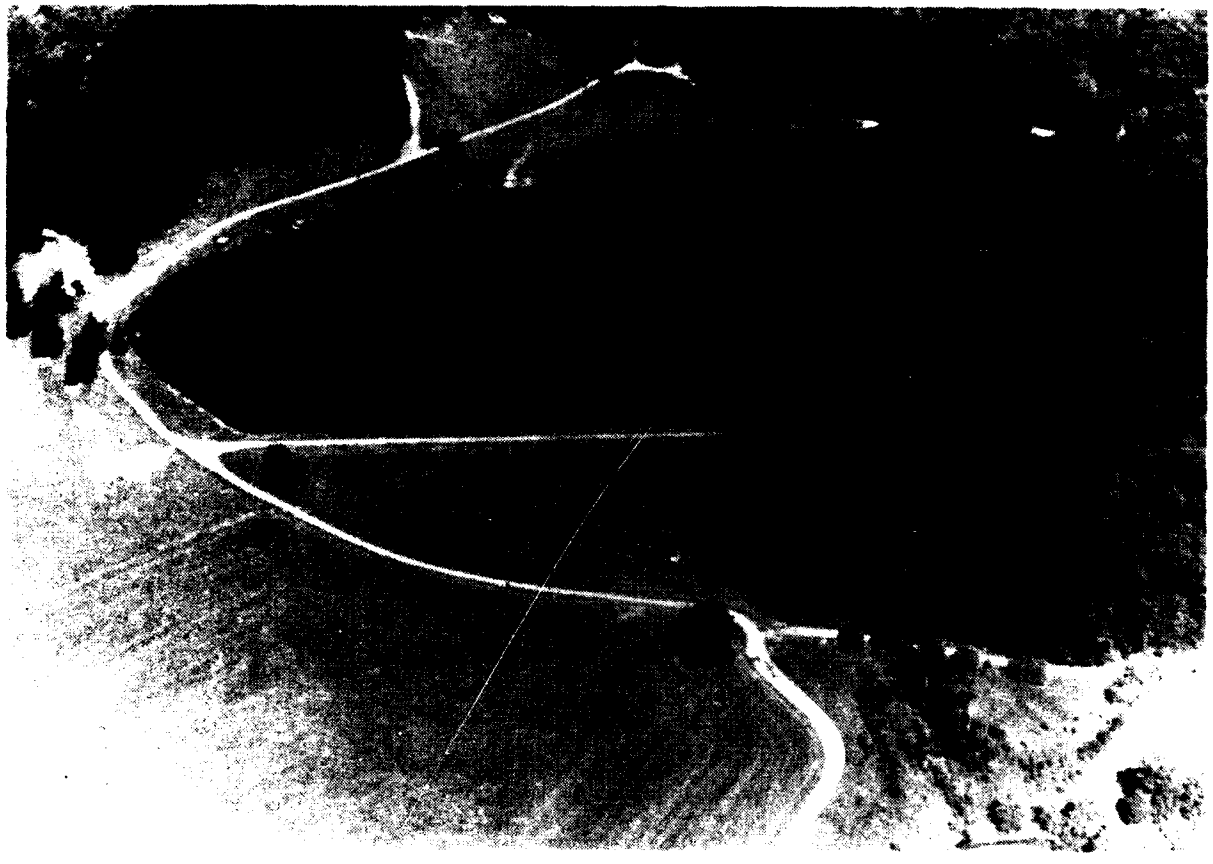
Lambert Dam is a linear earthfill structure 605 feet long and 53 feet high with a crest width of 18 feet. The upstream and downstream slopes are IV on 3.8H and IV on 3.4H respectively. It has a capacity of 336 acre-feet at normal pool and 454 acre-feet at the top of the dam.

The principal spillway consists of a 2.5 feet by 7.5 feet (ID) reinforced concrete riser which feeds a 30 inch diameter outlet pipe. Drawdown of the reservoir is controlled by a 24 inch square sliding headgate. The emergency spillway is an uncontrolled saddle type located just upstream of the right abutment. It runs parallel to the crest and is 117 feet in width. The embankment is well grassed and has no undesirable vegetation except for some 2 to 4 inch diameter pine trees located at the toe and left abutment tie in.

No signs of sliding, cracking, differential settlement or erosion were observed on the dam or in the area immediately downstream.

The dam is in the intermediate size and high potential category and should pass the Probable Maximum Flood (PMF). A hydraulic and hydrologic analysis reveals that during the PMF the dam will overtop by 1.3 feet for 4.75 hours. During the 1/2 PMF, the dam overtops by .65 feet for three hours.

The embankment appears to be structurally stable; however, it is considered "significantly deficient" because the spillway is inadequate. It is recommended that a qualified engineer be engaged to develop project modifications that will allow the dam to pass the PMF and that the owner perform routine maintenance operations.



OVERVIEW
LAMBERT DAM

SECTION 1 - GENERAL

1.1 Authority: The Phase I inspection of this dam was conducted under the authority of Tennessee Code Annotated, Section 70-2501 to 70-2530, "The Safe Dams Act of 1973", in cooperation with the US Army Corps of Engineers under the authority of Public Law 92-367, "The National Dam Inspection Act".

1.2 Purpose and Scope: This report is prepared under guidance contained in the Department of the Army, Office of the Chief of Engineers, "Recommended Guidelines for Safety Inspection of Dams", for a Phase I investigation. The purpose of the Phase I investigation is to identify expeditiously those dams which may pose hazard to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed analyses involving topographic mapping, subsurface investigation, testing, and detailed computational evaluations are beyond the scope of Phase I investigations. However, the investigation is intended to identify the need for any such study.

In the review of this report, it should be realized that the reported conditions of the dam are based on observations of field conditions at the time of inspection along with data available to the inspection team. Additional data or data furnished containing incorrect information could alter the findings of this report.

The analyses and the recommendations included in this report are related to the hazard classifications of the structure at the time of this report. Changes in conditions downstream of the dam may change the hazard classification of the structure. A change in hazard classification may in turn change the design flood on which the hydraulic and hydrologic analyses are based and may have a significant impact on assessment of the safety of the structure.

It is important to note that the condition of the dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions will be detected.

1.3 Past Inspections: Following the failure of the dam on October 12, 1963, the dam was inspected on October 17, 1963 by William P. Clark of the Tennessee Valley Authority. A written report and photos of this failure are on file with TVA. A summary of the report indicated that failure may have been due to the collapse of a 6-inch pipe that

existed through the dam. See Appendix H for a copy of this report. An inventory inspection was also conducted on 8 September 1980 by the Tennessee Department of Conservation, Division of Water Resources.

1.4 Details of Inspection: The Phase I inspection was conducted on April 21, 1981 by the US Army Corps of Engineers. It was surveyed by the Tennessee Department of Conservation, Division of Water Resources on the same date. The weather was clear and warm (72°). The reservoir was at normal pool, elevation 1059.0.

Inspection team members were:

Paul F. Bluhm	-	Civil Engineer Nashville District US Army Corps of Engineers
Timothy McCleskey	-	Civil Engineer Nashville District US Army Corps of Engineers
Tom Porter	-	Hydraulic Engineer Nashville District US Army Corps of Engineers
Troy Wedekind	-	Water Resources Engineer Tennessee Department of Conservation Division of Water Resources

SECTION 2 - PROJECT DESCRIPTION

2.1 Location: Lambert Dam is located about seven miles south of Maryville, Tennessee, and approximately one-half mile due east of the intersection of Montvale Road and Old Piney Road. It impounds a tributary of Big Spring Branch which is in turn a tributary of Sixmile Creek. The dam is shown on the US Geological Survey 7.5 minute Blockhouse Quadrangle Map at latitude 35° 39' 30"N and longitude 83° 57' 12"W. Location maps are provided in Appendix B of this report.

2.2 History of the Project: Design of the dam was by the Soil Conservation Service of Blount County and it was constructed in 1957 to impound a 17 acre lake for use as a farm pond. On October 12, 1963 a small leak occurred, presumably near a 6-inch pipe that existed through the dam. The size of the leak increased until the embankment caved in failing the dam. Although exact cause of failure was not determined it is thought to be due to failure of the 6-inch pipe which led to piping of the embankment material and a breach of the dam. Damage to the downstream area was limited to flooding of a church and slight damage to Montvale Road. The SCS redesigned the dam and it was reconstructed in 1964 by Blount Brothers Construction

Company. During the reconstruction, soil borings were taken from the borrow area and from the spillway foundation area by the SCS. The dam is now slightly larger and impounds a 20 acre lake. The dam was owned by J. B. Lambert when it failed in 1963, but is now owned by Keith McCord.

2.3 Size and Hazard Classification: According to CCE guidelines, the dam is in the intermediate size category with a height of 53 feet and a storage capacity of 336 acre-feet at normal pool level and approximately 454 acre-feet at the top of the dam. The structure is classified in the high hazard potential category because a house, small grocery store and county road located one-half mile downstream would be in the probable flood path should a sudden failure occur.

2.4 Description of Dam and Appurtenances:

2.4.1 Embankment: The embankment is a linear aligned earthfill structure presumably constructed of material (ML, CL and SC) excavated from the reservoir area. The dam has a maximum structural height of 53 feet. The crest is 605 feet in length, 18 feet wide, and varies in elevation from 1064.5 feet to 1067.4 feet. The upstream and downstream slopes are uniform and are inclined at IV on 3.8H and IV on 3.4H respectively. A small wave berm, 18 feet in width, and inclined at IV on 8H is located along the upstream face, 1.5 to 2.5 feet above the water surface.

The dam is underlain by Paleozoic Age rocks, mainly Cambrian and Lower Ordovician. The overburden at the dam site is composed of colluvial and local alluvial deposits of silty and sandy loam (ML, CL and SC) which were derived from sandstone, quartzite, slate and shale.

2.4.2 Emergency Spillway: The emergency spillway is a 117 foot wide saddle spillway located just upstream of the right abutment. The centerline of the spillway is parallel to the axis of the dam and exits to a broad, open meadow just upstream of the right abutment. The left side slope (toward the dam) is IV on 9.9H while the right side slope is IV on 7.6H. Although the entrance channel is steep (28.2%) the exit channel is fairly flat and uniform ranging from a beginning slope of .1% to a 6% slope 200 feet from the reservoir. The spillway ends in a large ravine 400 to 500 feet from the reservoir. A paved access road crosses the spillway at approximately 30 feet from the reservoir.

2.4.3 Service Spillway: The service spillway is a 2.5 feet by 7.5 feet reinforced concrete riser, 36 feet high and maintains a normal pool at elevation 1059.0. It is covered by a solid metal platform and has trash racks covering two sides of the structure. A grated metal walkway provides access to the structure.

The riser feeds a 30 inch diameter, reinforced concrete pipe, 336 feet long. The plans show 11 anti-seep collars along the length of the discharge pipe.

2.4.4 Drawdown Facilities: The drawdown facility consists of an 18 inch diameter pipe controlled by a 24 inch square slide gate. The gate is manually operated from the top of the riser.

2.4.5 Downstream Channel: The 30 inch diameter reinforced concrete pipe empties into a 25 foot diameter stilling basin. The channel exiting from the stilling basin is about 3 to 4 feet wide and widens to 5 to 6 feet after passing under a culvert 200 feet from the stilling basin. The channel then joins a larger stream and flows into a flat pasture before passing under Montvale Road one-half mile downstream from the dam.

2.4.6 Reservoir and Drainage Area: At normal pool level, elevation 1059.0, the reservoir impounds about 336 acre-feet of water and has a surface area of about 20 acres. At the top of the dam the reservoir volume is about 450 acre-feet. The size of the drainage area is 0.73 square miles. Major soil types in the watershed include Ramsey, Jefferson, and Montevallo series. The majority of the watershed is woods.

SECTION 3 - FINDINGS

3.1 Visual Findings:

3.1.1 Embankment: The upstream slope has a good, but short grass cover. Wave action has been eroding the wave berm somewhat but it does not appear to be serious at this time. The crest is straight and uniform and is covered with a thin layer of gravel. It is in good condition with the exception of some ruts made by vehicle traffic. The downstream slope also has a good but short grass cover. Apparently, the owner allows cattle to graze on the dam which keeps the grass short but also produces tracks and ruts. Because of these ruts parts of the downstream slope near the crest had to be reseeded. The dam was free of undesirable growth with the exception of a few 2 to 4 inch diameter pine trees which were located at the contact of the left abutment and the embankment and just past the toe of the dam. Two 5 inch diameter pine trees were also located on the embankment, about 20 feet from the end of the outlet pipe.

Two apparent wet areas were observed on the embankment. One was located on the left side at the toe of the dam and was about 20 feet in length and 3 feet wide. The other was at about station 0+50R, about two-thirds the way down the embankment. It was about 30 feet long and 10 feet in width. Because of the recent rains, it could not be ascertained if the areas were wet due to seepage through the the embankment or residual moisture from the rain. Two eight inch diameter toe

drains, located near the outlet structure were visible. Both were half filled with silt and had a slight trickle of water flowing from them.

3.1.2 Service Spillway: The service spillway is in good condition with the exception of some leaks in the construction joints of the riser. The worst leak was at the first construction joint (from the bottom) and according to the caretaker was keeping the lake below normal pool. The 30 inch diameter reinforced concrete pipe was in good condition and showed no signs of spalling or deterioration. The drawdown gate was not operated during the inspection but was reported to be in good condition. The stilling basin was in good condition with no signs of erosion or undercutting.

3.1.3 Downstream Channel: The downstream channel is relatively flat for the first few hundred feet and is well grassed with some trees and brush lining the banks. The channel then deepens (10 to 12 feet in depth) with heavy brush lining the steep banks. It then joins another stream which traverses through a well grassed pasture.

3.1.4 Reservoir and Drainage Area: The drainage area is steep and heavily wooded although part of the area bordering the lake is well grassed. There was no indication of any significant sedimentation.

3.2 Review of Data: Information available for review included a set of drawings that was prepared by the Soil Conservation Service for the repair of the dam following its failure. The plans called for the remedial work to key into the existing embankment. In addition, the plans also called for a toe drain which was evident by the 8-inch diameter pipes near the outlet structure.

3.3 Static and Seismic Stability - The actual margin of safety for static stability cannot be determined because the engineering data required for an analytical stability analysis are not available. However, an assessment of the embankment stability based on visual evidence and engineering judgment would indicate a stable structure due to moderate embankment slopes and the lack of leaks or seepage. The project is located in Seismic Zone 2, and according to OCE guidelines, should not be expected to be threatened by seismic effects provided static conditions are satisfied.

3.4 Hydraulic and Hydrologic Analysis - According to OCE guidelines, the design flood for an intermediate size dam in a high hazard area is the Probable Maximum Flood (PMF). Hydraulic analysis indicates that outflow resulting from the PMF (AMC II) will over top the dam by a maximum depth of 1.3' for a duration of 4.75 hours. Additional analysis indicates that outflow from the ½ PMF will overtop the dam by a maximum depth of .65' for 3.0 hours.

3.5 Conclusions and Recommendations:

3.5.1 Conclusions:

a. On the basis of visual evidence and engineering judgement, the dam is considered to be structurally stable. The embankment slopes are moderate and are considered adequate. The two wet areas found are not considered serious The project has the appearance that it is well constructed.

b. The leaks in the construction joints of the principal spillway do not pose a serious problem.

c. Small pine trees are present only at the embankment-abutment contact, toe of the dam and above the spillway outlet.

d. The dam is located in Seismic Zone 2, indicating that risk of damage from seismic activity is only moderate.

e. Hydraulic analysis indicates that the spillway will not pass the Probable Maximum Flood as required by OCE guidelines for dams of intermediate size and high hazard potential. Under the 1/2 PMF, the dam is overtopped by .65 feet for 3 hours. Failure would probably not occur during the 1/2 PMF.

f. The dam is considered "significantly deficient" solely because the spillway will not pass the appropriate design flood.

3.5.2 Recommendations:

a. The owner should engage the services of a qualified engineer to:

1. Develop project modifications to allow safe passage of the PMF.
2. Evaluate the leaks in the service spillway and make appropriate recommendations.
3. Direct the removal of pine trees and repair of embankment following their removal.

b. The toe drains should be cleaned out so they can function properly. They should be checked periodically for any deposition of additional material. A qualified engineer should be engaged to determine the cause of any further deposition.

c. The owner should not allow cattle to overgraze the embankment. Controlled grazing should be practiced to minimize damage to the embankment.

d. The two small wet areas on the embankment should be reinspected during a dry period to determine if they were a result of rainfall or actual seepage. A qualified engineer should be engaged to determine the cause of the wet areas if they are still present during a dry period.

e. The progression of the erosion of the wave berm shall be periodically checked. A qualified engineer should be engaged if the erosion becomes severe.

f. The drawdown gate on the service spillway should be operated at least twice a year.

g. An emergency action plan should be developed, including a warning system to alert downstream residents, in the event a serious condition develops with the dam.

h. The owner should establish a regular program of inspection and maintenance to provide detection and timely correction of problem areas.

SECTION 4 REVIEW BOARD FINDINGS

The Interagency Review Board for the National Program of Inspection of Non-Federal Dams met in Nashville on 27 August 1981 to examine the technical data contained in the Phase I investigation report for Lambert Dam. The Review Board considered the information and recommended that (1) the owner should engage the services of a qualified engineer if any deposition of material continues to occur in the toe drains, (2) cattle grazing on the embankment should be controlled to minimize damage to the embankment, and (3) the progression of the erosion of the wave berm should be periodically checked. They agreed with other report conclusions and recommendations. A copy of the letter report presented by the Review Board is included in Appendix G.

APPENDIX A

DATA SUMMARY

APPENDIX A
DATA SUMMARY SHEET
LAMBERT DAM
BLOUNT COUNTY, TENNESSEE

A.1 DAM

A.1.1 Type: The dam is a linear earth structure with an open channel emergency spillway exiting just upstream of the right abutment. The service spillway is a reinforced concrete riser with a 30-inch reinforced concrete drain pipe.

A.1.2 Dimensions and Elevations: Elevations are expressed in feet and are referenced from an assumed benchmark elevation of 1060.0.

a. Crest Length: 605 feet

b. Crest Width: 18 feet

c. Height: 53.4 feet (Low point of crest to D/S invert of spillway pipe)

d. Crest Elevation: 1064.5 feet

e. Emergency Spillway Elevation: 1061.8 feet

f. Service Spillway Elevation: 1059.0 feet (normal pool)

g. Embankment Slope, Upstream: IV on 3.8H

h. Embankment Slope, Downstream: IV on 3.4H

i. Size Classification: Intermediate

A.1.3 Embankment Zoning: Design drawings of the reconstructed section show that it was to be compacted to 95% Standard Proctor Density. As built drawings also show that a toe drain with two 8 inch CMPS was constructed.

A.1.4 Cutoffs and Grout Curtains: None

A.1.5 Instrumentation: None

A.1.6 Operation and Maintenance: The dam is maintained by the owner, Keith McCord, and his caretaker. The drawdown gate has not been operated in recent years.

A.2 RESERVOIR AND DRAINAGE AREA

A.2.1 Reservoir:

a. At Normal Pool

(1) Elevation: 1059.0

(2) Surface Area: 20 acres

(3) Storage: 336 acre-feet

(4) Length: 1700 feet

b. At Top of Dam

(1) Elevation: 1064.5 feet

(2) Surface Area: 25 acres

(3) Storage: 454 acre feet.

A.2.2 Drainage Area:

a. Size: 467 acres (.73 sq. mi.)

b. Soils: Jefferson, Ramsey

c. Average Slope: 25%

d. Land Uses: Woods, pasture, few roads or structures

e. Runoff from PMP (28.5 inches in 6 hours)

(1) AMC II: 25.5 inches

(2) AMC III: 27.5 inches

f. Runoff from 100 year storm (4.8 inches in 6 hours)

(1) AMC II: 2.3 inches

(2) AMC III: 3.5 inches

A.3 OUTLET STRUCTURES

A.3.1 Service Spillway and Drawdown Facilities:

a. Type - Reinforced concrete riser, 36 feet in height with 2.5' by 7.5' opening.

b. Pipe Size - 30" diameter, reinforced concrete, 336 feet long.

c. Pipe gradient - 3.5%

d. Drawdown - 18" opening covered by 24" slide gate. Manually operated.

A.3.2 Emergency Spillway: The spillway is just upstream of the right abutment and has a grass cover. It crosses a paved access road parallel to the abutment and empties into a broad meadow.

a. Elevation: 1061.8

b. Size: The spillway entrance has a width of 117 feet and side slopes of IV to 9.9H (left side toward dam) and IV to 7.6H (rt. side)

c. Maximum capacity: 743 cfs

A.4 HISTORICAL DATA

A.4.1 Original Construction Date: 1957

A.4.1.1 Failure Date: October 12, 1963

A.4.1.2 Reconstruction Date: 1964

A.4.2 Designer: Soil Conservation Service

A.4.3 Builder: Lambert Brothers Construction Company

A.4.4 Owner: Keith McCord

A.4.5 Previous Inspections: October 17, 1963 by William P. Clure of TVA following failure on October 12, 1963

A.4.6 Seismic Zone: 2

A.5 DOWNSTREAM HAZARD DATA

A.5.1 Downstream Hazard Classification: High

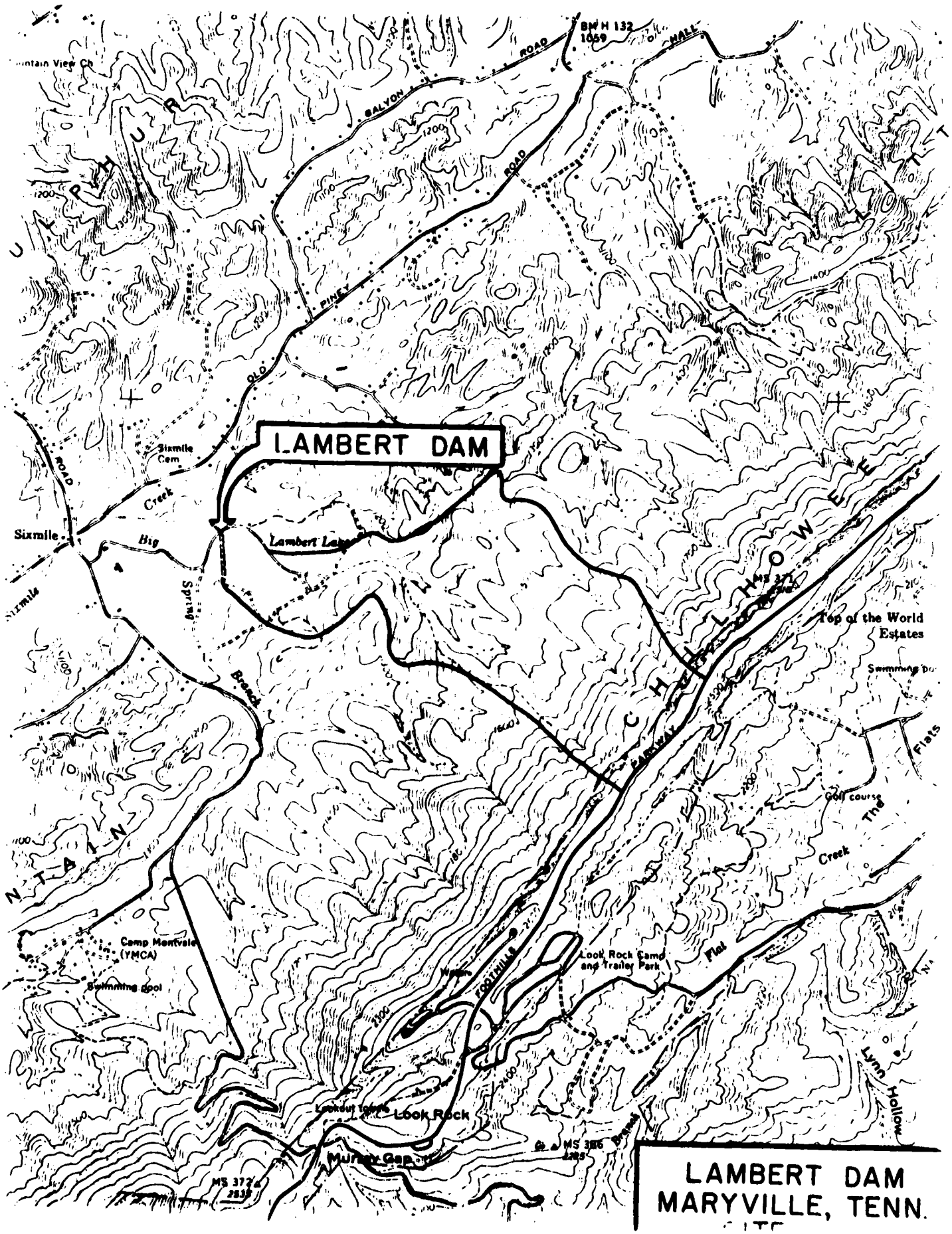
A.5.2 Persons in Likely Flood Path: Approximately 4 to 10

A.5.3 Downstream Property: One house, a grocery store and county road.

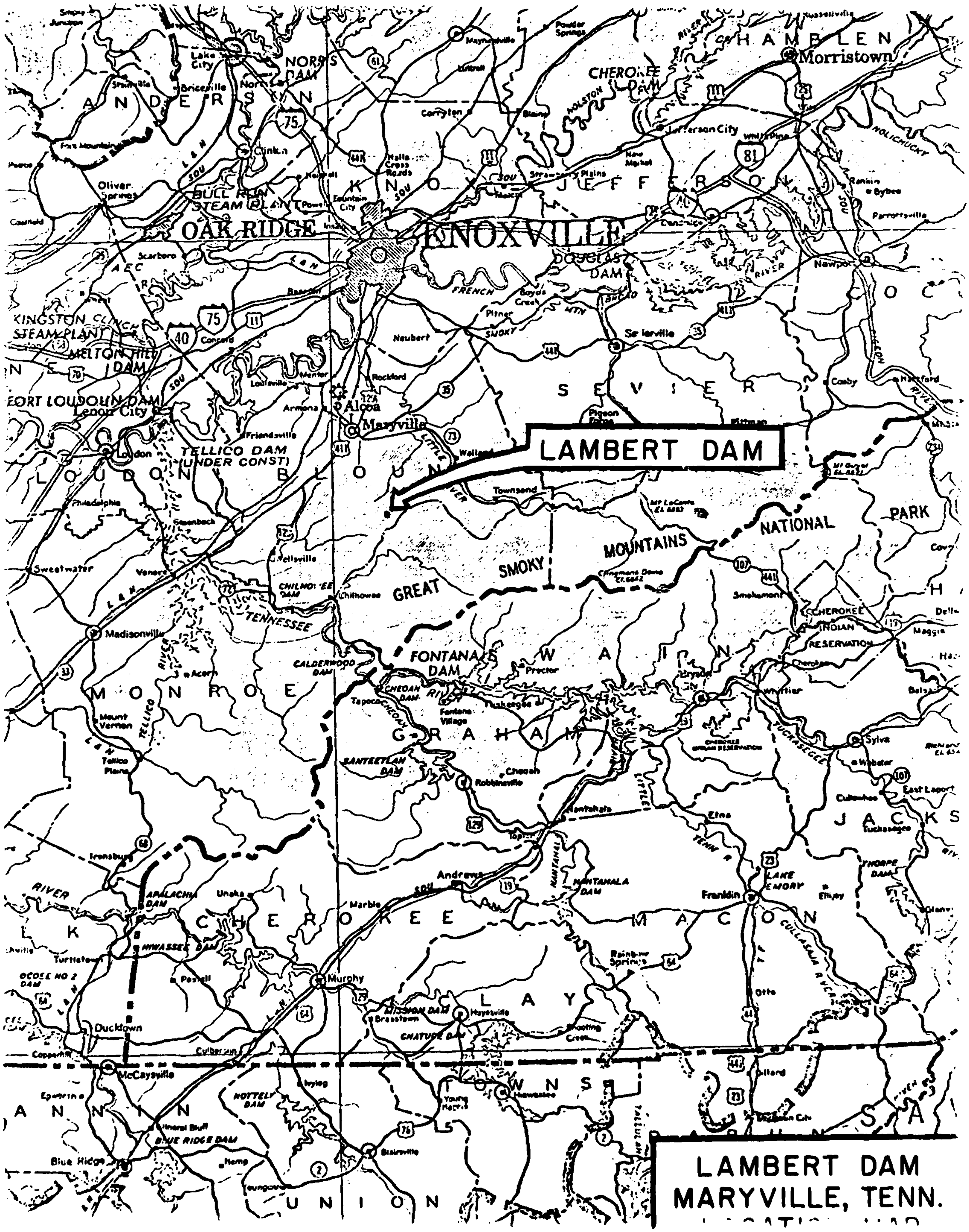
A.5.4 Warning Systems: None

APPENDIX B

SKETCHES AND LOCATION MAPS



LAMBERT DAM
MARYVILLE, TENN.


LAMBERT DAM
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OAK RIDGE
Morristown
NORRIS DAM
CHEROKEE DAM
BULL RUN STEAM PLANT
KINGSTON STEAM PLANT
MELTON HILL DAM
FORT LOUDOUN DAM
Lenoir City
Loudon
TELLICO DAM (UNDER CONST)
DOUGLAS DAM
Alcoa
Maryville
Townsend
Sevierville
Newport
Jefferson City
Clinton
Oliver Springs
Madisonville
Sweetwater
Philadelphia
Chilhowee
CHILHOWEE DAM
CALDERWOOD DAM
FONTANA DAM
GREAT SMOKY MOUNTAINS NATIONAL PARK
CHEROKEE INDIAN RESERVATION
SANTEETLAH DAM
Robbinsville
Andrews
Murphy
Franklin
Sylva
Hayesville
Ducktown
McCaysville
Blue Ridge
Blairsville
APALACHIA DAM
HIWASSEE DAM
CHATUGE DAM
NOTTELY DAM
BLUE RIDGE DAM
NANTAHALA DAM
ANDERSON
KNOX
JEFFERSON
SEVIER
BLOUNT
LOUDON
MONROE
GRAHAM
SWAIN
CHEROKEE
CLAY
MACON
JACKSON
UNION
TOWNS
LAMBERT DAM
MARYVILLE, TENN.

LAMBERT DAM
BLOUNT COUNTY, TENNESSEE
PLAN VIEW
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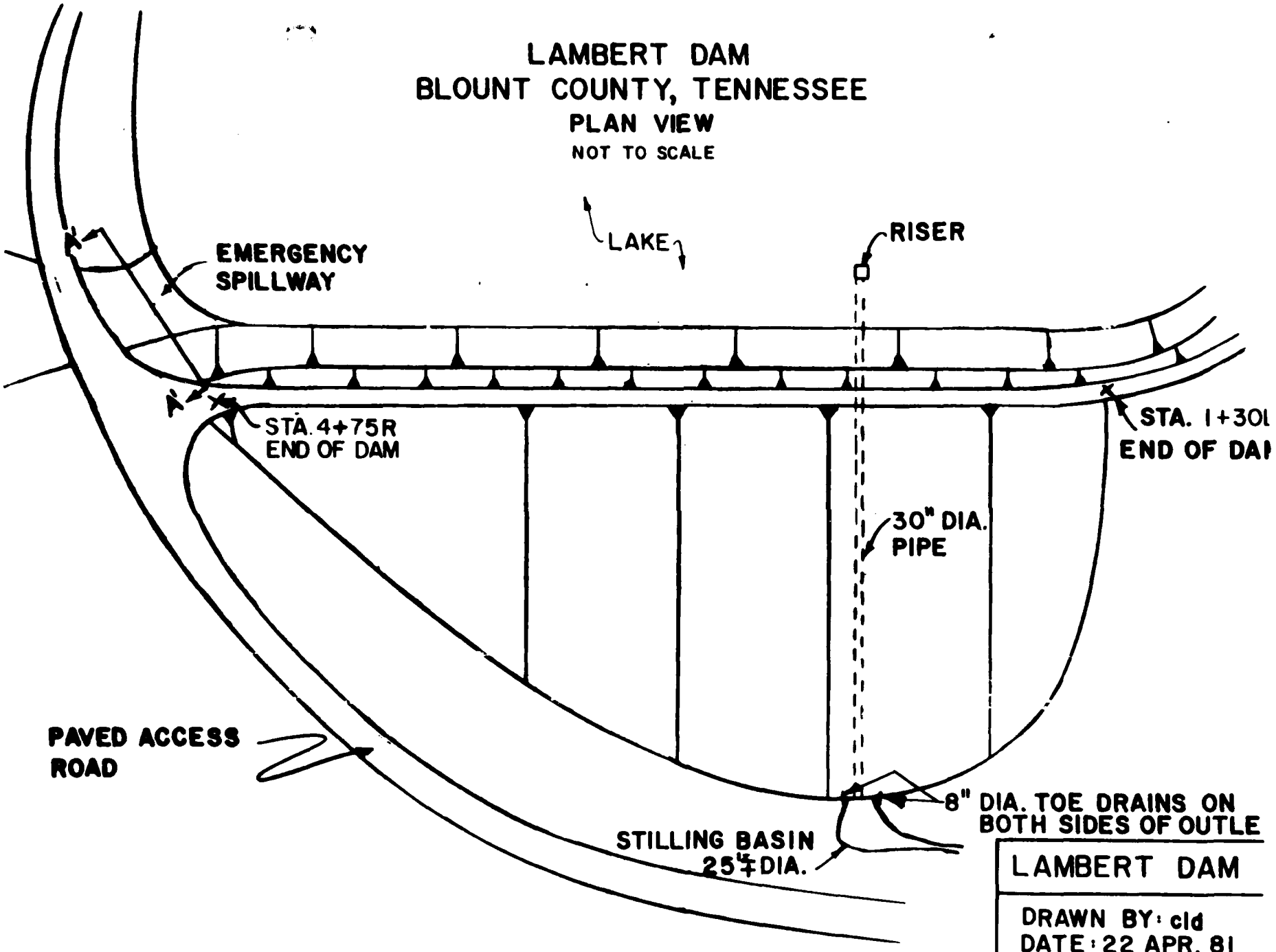
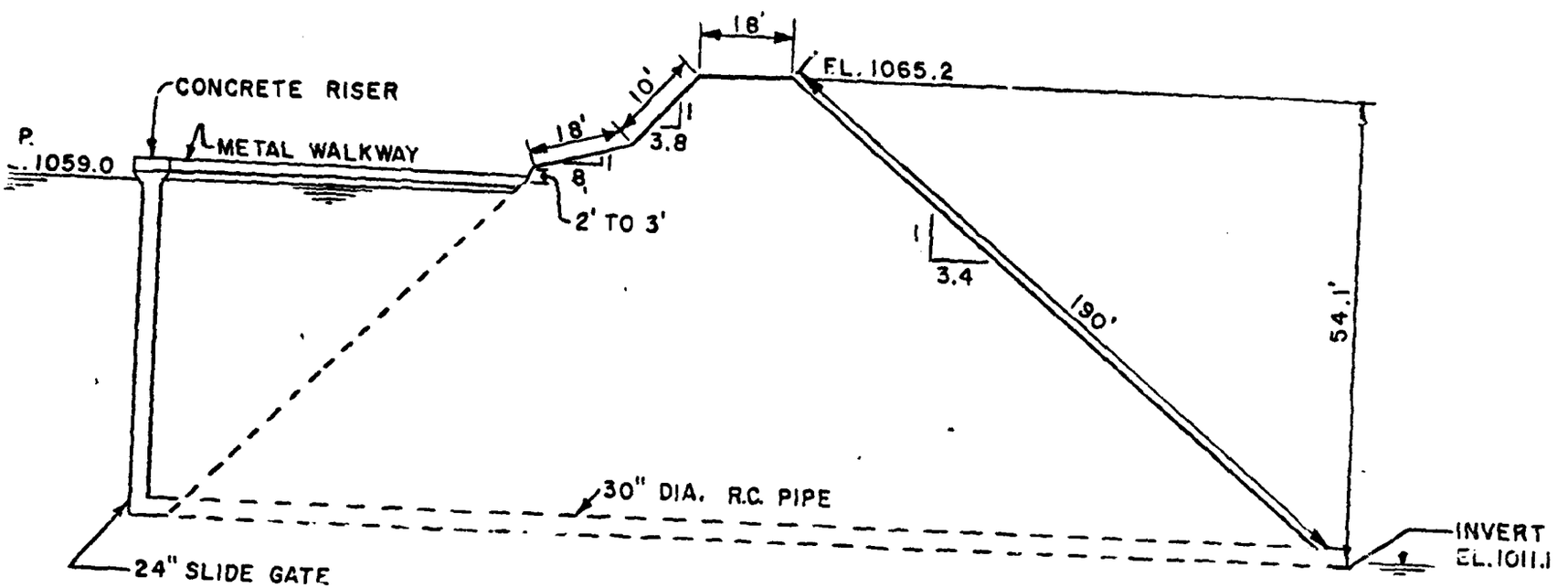


LAMBERT DAM

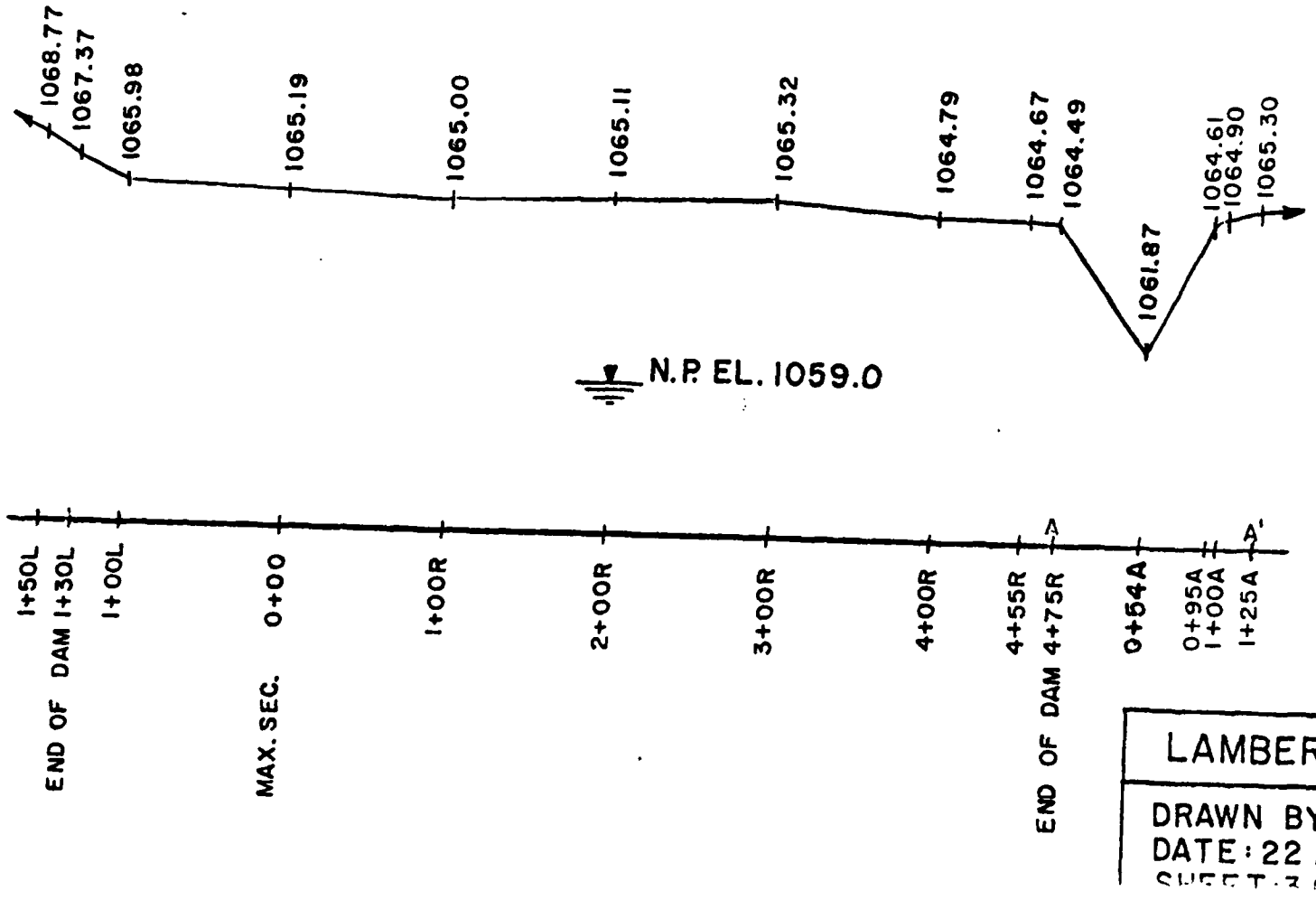
DRAWN BY: cld
DATE: 22 APR. 81
SHEET: 1 OF 5

LAMBERT DAM
BLOUNT COUNTY, TENNESSEE
MAXIMUM SECTION STA. 4+75
NOT TO SCALE



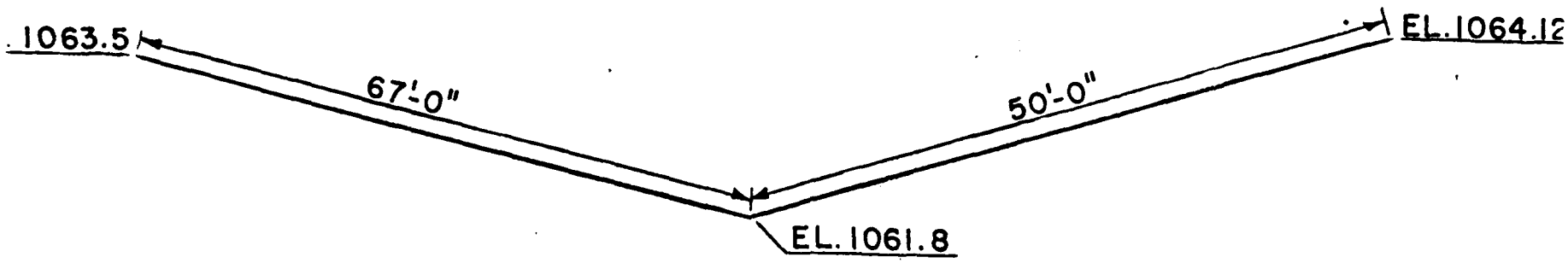
LAMBERT DAM
DRAWN BY: cld DATE: 22 APR. 81 SHEET 2 OF 5

LAMBERT DAM
BLOUNT COUNTY, TENNESSEE
EMBANKMENT PROFILE
LOOKING DOWNSTREAM
NOT TO SCALE



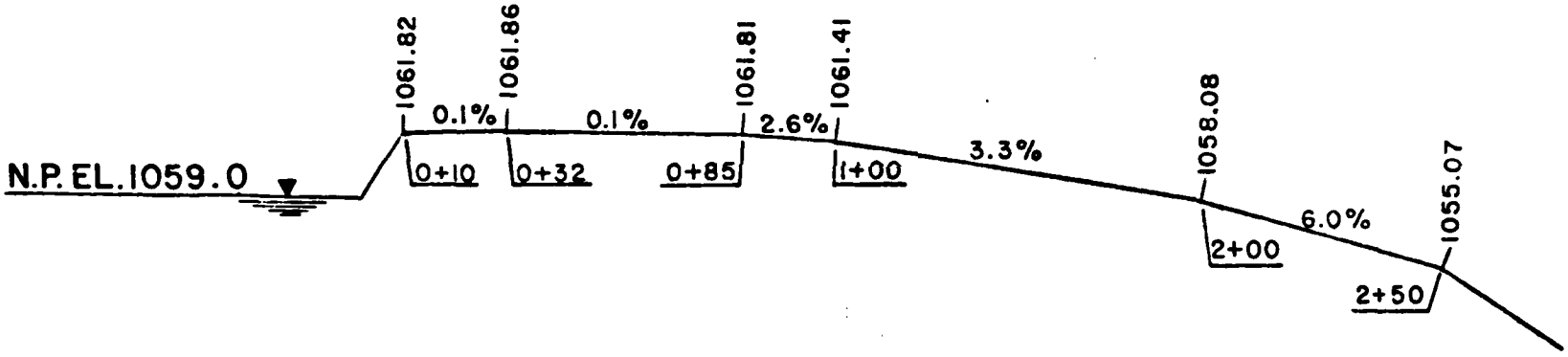
LAMBERT DAM
DRAWN BY: cld DATE: 22 APR. 81 SHEET 3 OF 5

LAMBERT DAM
BLOUNT COUNTY, TENNESSEE
EMERGENCY SPILLWAY CROSS SECTION
ALONG PAVED ACCESS ROAD
LOOKING NORTH
NOT TO SCALE



LAMBERT DAM
DRAWN BY: cld
DATE: 22 APR. 81
SHEET: 4 OF 5

LAMBERT DAM
BLOUNT COUNTY, TENNESSEE
EMERGENCY SPILLWAY PROFILE
NOT TO SCALE



LAMBERT DAM

DRAWN BY: cld
DATE: 22 APR. 81
SHEET 5 OF 5

APPENDIX C

PHOTOGRAPHIC RECORD

APPENDIX C
PTOTOGRAPHIC RECORD

Photograph No.	
1	Downstream slope of dam
2	View of access road and right abutment
3	Upstream slope of dam. Note erosion of wave berm
4	Crest of dam
5	Crest of dam. Note ruts with standing water
6	Downstream slope of dam from right abutment. Note reseeded area
7A	Contact between left abutment and embankment. Note pine trees
7	Contact between toe of dam and downstream area. Note pine trees
8	Emergency spillway entrance channel
9	Emergency spillway crossed by access road.
10	Exit channel of emergency spillway
11	Principal spillway and riser
12	Outlet pipe and stilling basin. Note pine tree on the embankment
13	Toe drain partially covered
14	Downstream channel
15	Downstream channel 200 feet from outlet pipe
16	View from crest of downstream area
17	View of "lowpoint" in access road.

PHOTO NO. 1

PHOTO NO. 2

PHOTO NO. 3

PHOTO NO. 4

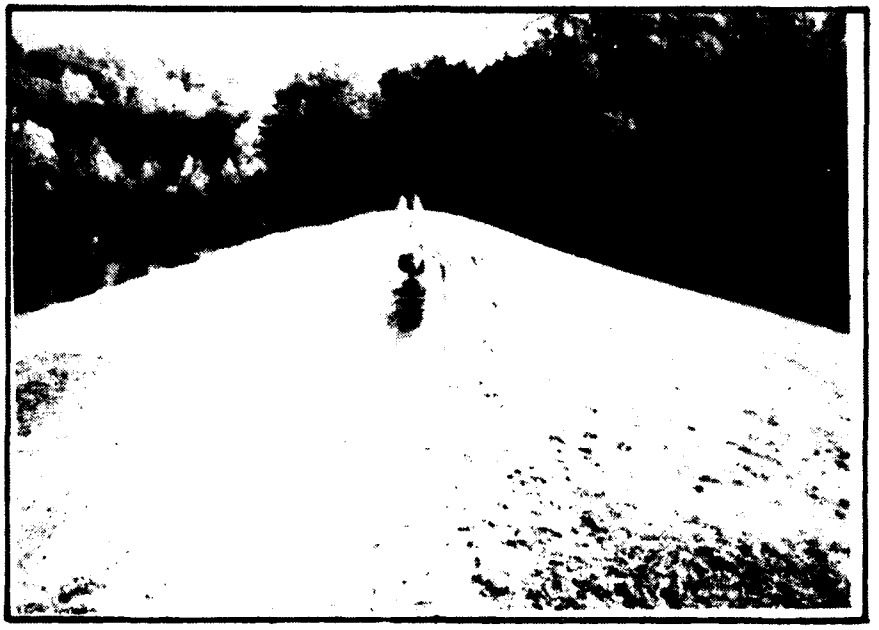


PHOTO NO. 5

PHOTO NO. 6

PHOTO NO. 7A

PHOTO NO. 7

PHOTO NO. 8

PHOTO NO. 9

PHOTO NO. 10

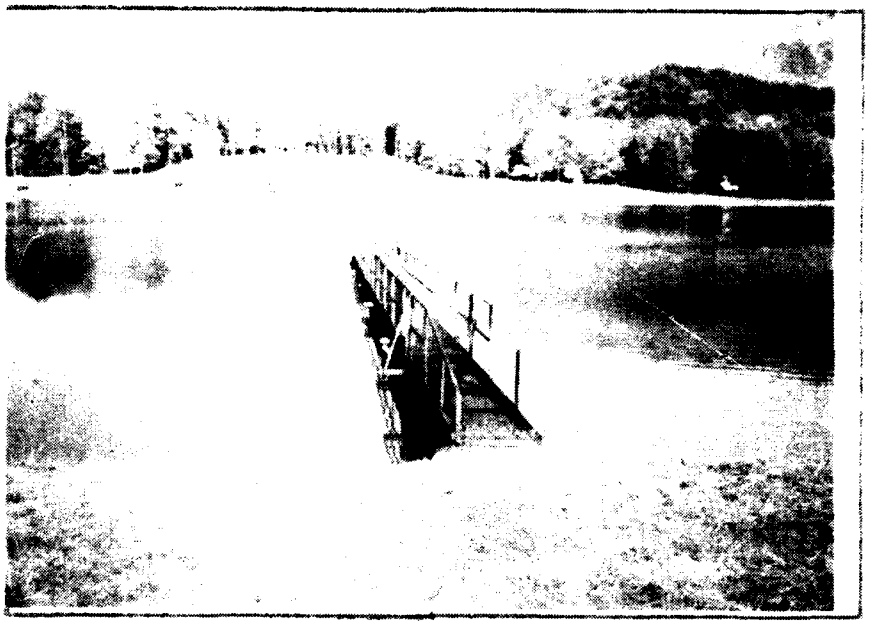


PHOTO NO. 11

PHOTO NO. 12

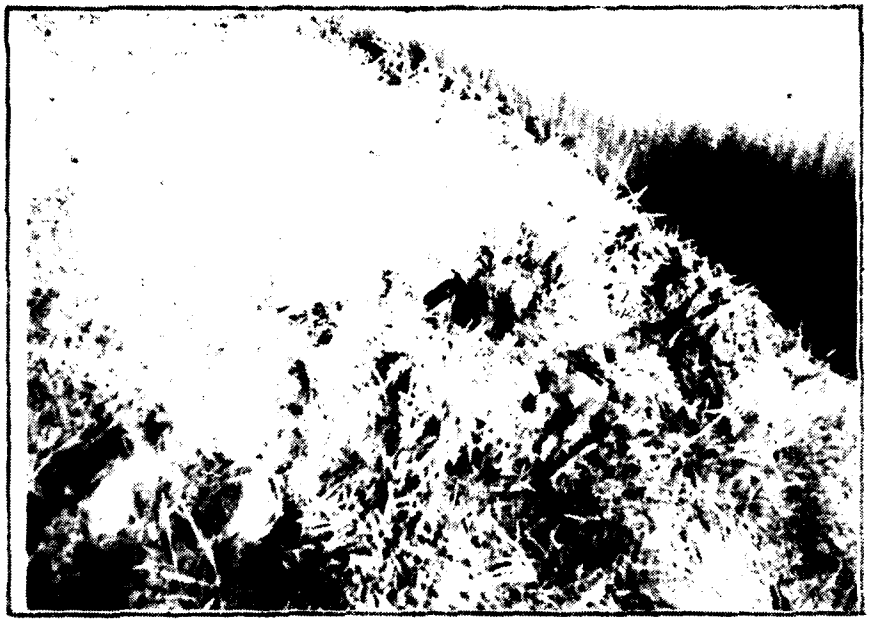


PHOTO NO. 13

PHOTO NO. 14

PHOTO NO. 15

PHOTO NO. 16

PHOTO NO. 17

APPENDIX D

TECHNICAL CRITIQUES

ORNED-G 4 May 1981

MEMORANDUM FOR RECORD

SUBJECT: Phase Investigation of Lambert Dam

1. An inspection team, composed of engineers from the Corps of Engineers and Tennessee Water Resources Department, conducted a Phase I investigation on Radnor Dam, near Maryville, Tennessee on 21 April 1981 Listed below are members of the inspection team:

Paul Bluhm	Civil Engineer	Corps of Engineers
Tim McCleskey	Civil Engineer	Corps of Engineers
Tom Porter	Hydraulic Engineer	Corps of Engineers
Troy Wedekind	Water Resources Engineer	State of Tennessee

2. Lambert Dam is owned by Keith McCord of Maryville, Tennessee and is used as a farm pond. The dam is located approximately 7 miles south of Maryville, and is on a tributary of Big Spring Branch which is in turn, a tributary of Six Mile Creek. The dam was originally designed by the Soil Conservation Service and was constructed by Lambert Brothers Construction Company in 1957. The dam failed in October of 1963 and the SCS again provided the design plans for its reconstruction.

3. Prior to inspecting the dam, the inspection team went to the Blount County SCS office. Mr. Dewey Simpson of the SCS, had photographs of the failure in 1963 and provided information concerning the failure. The exact cause of failure was not determined. However, Mr. Simpson said the failure may have been due to the collapse of the 30-inch concrete outlet pipe or of an 8-inch pipe that extended through the dam that was used for irrigation purposes. No lives were lost and property damage was limited to flooding of a church basement 1/2 mile downstream. The church has since been relocated.

4. The dam is an earth embankment 605 feet in length, 54 feet in height and impounds a 20 acre lake. The reservoir contains an estimated 336 acre-feet at normal pool and 454 acre-feet at the crest of the dam. Observations noted at time of inspection are as follows:

a. Upstream slope - The upstream slope of 1V to 3.8H meets an 18-foot wide wave berm. The wave berm lies on a 1V to 8H slope and is about 1.5 feet above normal pool level. Both the slope and the wave berm are well grassed. Wave action is eroding the berm somewhat, but was not considered serious.

b. Crest - The 18-foot wide crest was straight and uniform. It was covered with a thin layer of gravel and was used as a road. It was in good condition except for some vehicle tracks in which 1-2 inches of water was standing.

c. Downstream slope - The downstream slope of 1V to 3.4H agrees with that shown on the "as built" drawings. The slope was uniform and had a good grass cover although it was very short due to the cattle that grazed on it. Near the crest, the owner had to reseed part of the embankment due to the tracks made by the cattle. Small pine trees, 2-4 inches in diameter were present at the contact between the left abutment and the embankment and at the toe of the dam. Two pine trees, 5 inches in diameter were also present at the toe, directly above the 30-inch outlet pipe. Two, small wet areas were found. The first was on the left side at the contact between the toe and natural ground. There was a small swale at this point and the moisture observed could possibly be retainage from recent rains. The second wet area was about 2/3 the way down the embankment, just to the right of the outlet structure at Station 7+00. It was 25 to 30 feet in length and 10 feet wide. Again, it is possible that this area was still wet due to recent rains. Two 8-inch diameter CMP toe drains were visible near the outlet of the 30-inch diameter pipe. Both were about half filled with material and water and had a very small flow exiting from them.

d. Abutments - Both abutments were in good condition. No significant erosion or seepage was observed. A paved access road was on the right abutment.

e. Emergency Spillway - The emergency spillway was a 125-foot wide saddle type, located on the right side of the embankment. It runs parallel to the crest and crosses the paved access road and exits into a broad field just upstream of the right abutment. Water was present in the spillway, between the reservoir and the access road, but this was due to the recent rainfall. The spillway was in good condition with a good grass cover.

f. Principal Spillway - According to the "as built" plans, the principal spillway consists of a reinforced concrete riser 36 feet in height, feeding a 30-inch diameter reinforced concrete pipe. Access to the structure was by means of a 110 foot walkway. The structure was covered by a solid metal platform. Trash racks, 9.5 feet by 1 foot were present on two sides of the structure, and both were clear of debris. An inspection of the 7.5 by 2.5 foot opening revealed that there was considerable leakage at the first construction joint. With the exception of this leakage, the structure was in good condition. Drawdown facilities consisted of a 18-inch diameter inlet, operated by a 24-inch sliding headgate. The gate is manually operated but was not operated at the time of inspection. A 336 foot, 30-inch diameter reinforced concrete pipe was fed by the riser and exits into a stilling basin at the toe of the dam. The 30-inch pipe was in excellent condition.

g. Stilling basin - Located at the toe of the dam, the stilling basin was about 25 to 30 feet in diameter and has its slopes protected by large concrete slabs. Small trees and saplings were present as was a good grass cover in places where concrete slabs weren't placed. The flow from the 30-inch pipe was estimated to be between 60 and 100 gpm and was very clear. Riprap placed directly below the outflow prevented any erosion.

h. Downstream channel - The channel downstream of the stilling basin had a base width of 4-5 feet and side slopes of about 1V to 3 H. The slopes were well grassed and lined with small trees. About 250 feet downstream, the stream passes under an access road through an old riser culvert. The channel widens to about 6-8 feet in width and has a heavier brush cover lining the banks. The stream then flows into a flat pasture before flowing under Montvale Road 1/2 mile from the dam.

i. Reservoir - An access road encompasses most of the reservoir. The slopes were moderately steep with a good grass cover around about half of the reservoir and woods around the rest. A low point exists on the access road across from the crest and it was at about the same elevation as the crest.

5. Potential downstream damage if rapid failure occurred could include a house, small store, and Montvale Road.

6. The undersigned concluded from the visual inspection that:

a. The small trees growing near the left embankment, below the toe of the embankment, and those above the 30-inch pipe should be removed.

b. Cattle should not be allowed to graze on the embankment.

c. The solid metal platform covering the principal spillway should be replaced with a grated platform.

d. Hydraulic and hydrologic analyses should be conducted to determine the adequacy of the spillway.

e. The two small wet areas on the downstream embankment should be re-inspected during a dry period to determine if they were a result of rainfall or actual seepage.

f. The two toe drains should be cleaned out so that they can function properly.

g. The concrete riser should be repaired to prevent seepage that is entering the first construction joint.

ORNED-G 4 May 1981

SUBJECT: Phase I Investigation of Lambert Dam

h. The owner should maintain a regular program of regular inspection and general maintenance. The objective of the program should be for the early detection and timely correction of any problem areas.

PAUL F. BLUHM
Civil Engineer

MCCLESKEY/ED-G

COUCH/ED-G

ORNED-G 30 April 1981

MEMORANDUM FOR RECORD

SUBJECT: Trip Report on the Inspection of Lambert Dam, Blount County, Tennessee

1. A Phase I inspection of Lambert Dam was made 21 April 1981 by Messrs. Paul Bluhm, Tom Porter, and Timothy McCleskey. Troy Wedekind and a two-man surveying crew from the Division of Water Resource, State of Tennessee, the carekeeper, and the wife of the owner of the dam were also present during the inspection. The dam is located about 7 miles south of Maryville, Tennessee, and approximately one-half mile due east of the intersection of Montvale Road and Old Piney Road. It is shown on USGS Blockhouse Quadrangle, Blount County, Tennessee, dated 1966. The owner is Mr. Keith McCord. During the inspection, the weather was clear, sunny, warm, slightly windy, and temperatures in the low 70's.

2. Before the inspection, the inspection team talked with Mr. Dewey Simpson, District Conservationist, of the Soil Conservation Service, about the history, safety, and structural adequacy of the dam. We were informed that the dam failed in 1963 at a section along the service spillway outlet pipes. The outlet pipes consisted of a 30-inch concrete pipe with an upstream valve and a 6-inch steel pipe with a downstream valve. The original design included two 30-inch concrete pipes; however, the owners chose to install the 30-inch and 6-inch pipes. The cause of failure was not given, but a pipe failure and subsequent piping along one of the pipes is suspected. No loss of life or injuries resulted from the failure and property damage was mostly confined to the property of the owner. A church building located near the intersection of Montvale Road and Old Piney Road was partially flooded and damaged. This building has since been relocated. Mr. Simpson showed us photographs of the dam and downstream area after the failure, but he was reluctant to provide us with negatives of these photographs. The dam was initially designed by the SCS in the early sixties, prior to 1963. After the 1963 failure, a redesign to repair the breached section was prepared by the SCS and construction was completed about 1965.

3. The underlying rock at the dam probably includes shales, sandstones, and slate. Rock exposed in cuts at the dam and in nearby road cuts consists of highly weathered sandstones and shales. These exposed rocks appeared to be inclined at very high angles. Based on information provided in the SCS soil survey report for Blount County and USGS geology maps, the rock in the vicinity of the dam is Paleozoic in age - mainly Cambrian and lower Ordonician. These rocks have been subjected to intense earth movements and are highly folded and faulted. The region is characterized by series of alternate linear ridges and valleys extending in the southwest-northeast direction. The overburden at the dam site is composed of colluvial and local alluvial deposits of

silty and sandy loam or ML, CL, and SC materials, which were derived from sandstone, quartzite, slate, and shale. The dam was constructed from material excavated from the lake, which includes sandy loam or ML, CL, and SC materials. These materials are characterized by the presence of many angular sandstone cobbles, 3 to 10-inches in diameter. Such cobbles were quite noticeable on the downstream slope.

4. The dam is a linearly earthfill structure approximately 605 feet long and 54 feet high. It has a crest width of about 18 feet and upstream and downstream slope dimensions of 1:3.8 and 1:2.7 respectively. The upstream slope has a 10-15 wave berm about 2.5 feet below the crest which slopes gently toward the pool. The slope immediately below this berm and just below the pool level is near vertical and badly eroded from wave wash. A service spillway, consisting of a concrete riser and a 30-inch diameter concrete outlet pipe, is located about 130 feet from the left abutment. A low area on the reservoir rim, just upstream of the right abutment, serves as an emergency spillway. The access road to the dam has an asphalt surface. It traverses the axis of the dam at the right abutment and extends across the emergency spillway and along the right reservoir rim, providing access to two houses upstream of the lake. A 20-25 feet section of this road along the reservoir rim is approximately 0.5 feet lower than the crest of the dam. In the event the lake reaches this level, water would spill over the emergency spillway and this section of the road before the dam is overtopped. Two 8-inch metal outlet pipes, located at the toe of the dam and to the immediate left and right of the service spillway outlet pipe, drains an internal sand and gravel toe drain. The right toe drain pipe was covered during the initial part of the inspection, but was later uncovered by Troy Wedekind. Only a trickle of water was flowing through either pipe. The area surrounding the right toe drain pipe was wet, soggy, and holding pockets of standing water before the outlet was uncovered. About 5-inches of water were flowing through the service spillway outlet pipe. The stilling basin consists of the old natural channel bed overlain with sandstone boulders and huge chunks of the old concrete riser - apparently left from the 1963 failure.

5. No cracks, scarfs, or evidence of sloughing or sliding were observed along the crest, slopes, or abutments. The slopes are fairly uniform and contain a relatively good vegetative cover of fescue, clover, lespedeza, and other grasses. Surface erosion, except for wave wash on the upstream slope, was minimal. The owner has permitted livestock to graze on the dam. This practice has caused the turf to be churned up, particularly near the crest and has destroyed the grass cover in certain areas. However, these areas have been reseeded and mulched and new grass is growing. The only undesirable growth on the dam consisted of several 2 to 4-inch diameter trees located at the left abutment contact and along or just below the left toe of the dam. Two areas on the downstream slope were somewhat wetter than the rest of the downstream slope area. One area was at the toe where the slope intersects the natural ground just left of the spillway outlet pipe. The other area is about 50 feet

to the right of the spillway outlet pipe and about two-thirds the distance down the slope. Both areas appeared to be wet from surface water draining slowly off the dam. The crest, which has a thin layer of crushed stone, provides vehicular access to the left abutment and reservoir rim.

6. During the inspection, water was spilling into the service spillway riser from the sides. No water was flowing in from the top because the reservoir had not reached the top of the riser. A walkway, about 50 feet long, extends from the crest out to the top of the riser. A platform constructed at the top of the riser provides a service area for operating the drawdown gate and opening or closing a solid steel hinged plate over the opening at the top of the riser. While this plate protects the spillway from being clogged with debris, it also prevents using the spillway to its full capacity when the level of the reservoir is above the riser, unless the plate is open. A grate would be a much better covering, since it could prevent entrance of debris that may clog the spillway and yet leave the spillway open for near full discharge capacity. Observation of discharge into the riser indicated leakage along the upper construction joint.

7. The drainage area, except for small areas immediately adjacent to the reservoir, is woody. The slopes in the drainage area are gentle to steep - but mostly steep. No evidence of sliding, cracking, or subsidence were observed along the reservoir rim or within the drainage area. The channel downstream of the dam is relatively shallow, narrow, and slopes gently with adjacent terrain. The surrounding land is mostly pasture, although some trees align the banks of the creek. The downstream banks are near vertical at places but overall are fairly flat and in some areas grassed. The banks appeared to be stable. No boils or seepage was observed downstream of the dam.

8. It appears there are two buildings in the paths of flood waters, should the dam fail again. One is a house located on the property of the owner and the other is a store - possible residence, located near the intersection of Montvale Road and Old Piney Road. Since both buildings are occupied, at least on a part time basis, the dam is in the high hazard potential classification. The dam is 54 feet high and is classified as an intermediate-size dam. Overall, the dam appeared to be well maintained and in good condition. However, the following recommendations are given in the interest of increasing the safety of the dam:

a. All trees at the left abutment contact and toe of the dam should be removed.

b. Outlet pipes for the toe drains should be kept open and cleared of all soil and other debris at all times.

c. The steel plate over the service spillway riser opening should be changed to a grate covering.

d. Livestock should not be permitted to graze on the dam.

TIMOTHY MCCLESKEY
Chief, I&I Section

COUCH/ED-G

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

REFERENCE OR OFFICE SYMBOL	SUBJECT
ORNED-H	Dam Inspection of Lambert Dam (Blount Co.)

TO: Chief, E & D Br. Sec. I FROM: Chief, H & H Br. DATE: 29 May 1981 CMT 1

INP Porter / 15632

1. Specific hydraulic and structural data on Lambert Dam is given in Memorandums For Record by Timothy McCleskey dated 30 April 1981 and by Paul J. Bluhm dated 4 May 1981.

2. The drainage area above Lambert Dam is 0.73 square miles.

3. The dam was classified as intermediate size and high hazard potential. The hazard classification was considered justified because of the home and store located downstream of the dam.

4. The PMF event was used to evaluate Lambert Dam. Antecedent Moisture Conditions II and III were used to analyize the project. The computer program HEC1DB was used to develop inflow hydrographs and route them through the dam. The program used the SCS dimensionless unit hydrograph to develop inflow hydrographs. For each routing, water was assumed to be at the invert of the opening in the drop inlet. The PMP was a 24 hour duration of 38.0 inches with a maximum 6 hour intensity

of 28.5 inches. Resulting runoff for AMC II conditions was 34.5 inches (24 hour) and 36.0 inches (24 hour) for AMC III conditions.

5. Results of the routings showed that Lambert Dam would be overtopped by both PMF and ½ PMF events. A table of these results are attached.

6. Since Lambert Dam was classified as intermediate size and high hazard the spillway design flood is a PMF. Based on the results given above we consider the dam to be hydrologically unsafe.

7. We concur in the conclusions and recommendations made in the aforementioned memorandums for record.

Connor

DW
Williams/ED-H

1 Encl. as

CORPS OF ENGINEERS, U.S. ARMY OHIO RIVER DIVISION	COMPUTATION SHEET	PAGE OF PAGES
INSTALLATION	SUBJECT	DATE
COMPUTED BY	COMPUTATION	NUMBER
CHECKED BY		

LAMBERT DAM (BLOUNT CO.)

	spillway design flood	Antecedent Moisture Conditions	
		AMC II (CN 75)	AMC III (CN 88)
24 hour duration	PMF	1.30' overtop 6 hr duration	1.31' overtop 6.25 hr duration
	1/2 PMF	0.63' overtop 3.25 hr duration	0.65' overtop 3.50 hr duration
	100YR	2.1' freeboard	1.3' freeboard
6 hour duration	PMF	1.32' overtop 4.75 hr duration	1.32' overtop 4.75 hr duration
	1/2PMF	0.65' overtop 3 hr duration	0.65' overtop 3 hr duration
	100YR	2.2' freeboard	1.6' freeboard

Check List
Visual Inspection of Earth Dams
Department of Conservation
Division of Water Resources

Name of Dam Lambert Dam

County Blount Date of Inspection 21 April 1981

ID # - State _____ Federal TN-901

Type of Dam Earthen

Hazard Category-Federal High State Tennessee

Weather Clear - Warm Temperature 75°

Pool at Time of Inspection El 1059.00 (6.2' from crest) (distance from crest)

Tailwater at Time of Inspection 10000 (distance from stream bed)

Design/As Built Drawings Available: Yes X No _____

Location: SCS Office in Nashville

Copy Obtained: Yes X No _____

Reviewed: Yes X No _____

Construction History Available: Yes _____ No _____

Location: _____

Copy Obtained: Yes _____ No _____

Reviewed: Yes _____ No _____

Other Records and Reports Available: Yes X No _____

Location: Photos of failure on file in SCS office in Maryville TN

Copy Obtained: Yes _____ No X

Reviewed: Yes X No _____

Prior Incidents or Failures: Yes X No _____

Inspection Personnel and Affiliation:

Paul Bluhm Corps of Engineers _____

Tim McCleskey Corps of Engineers _____

Tom Porter Corps of Engineers _____

Troy Wedekind Tennessee Department of Water Resources _____

I. Embankment

A. Crest

Description (1st inspection) Top of crest is used as a gravel road. There are some ruts and water standing due to traffic. Cattle tracks have also made some ruts.

1. Longitudinal Alignment Straight. Extends from left abutment to paved road on right abutment.

2. Longitudinal Surface Cracks None were seen

3. Transverse Surface Cracks None were seen.

4. General Condition of Surface Good condition other than traffic ruts

5. Miscellaneous Paved road crosses crest at right abutment.

B. Upstream Slope

1. Undesirable Growth or Debris There are some small shrubs and trees near left abutment. Otherwise the slope is clear.

2. Sloughing, Subsidence, or Depressions None was seen

3. Slope Protection An 18 foot wide berm is present at about 1½' above normal pool. This berm is 2½' below the crest and has a good grass cover. However, it is being eroded away by wave action.

a. Condition of Riprap N/A

b. Durability of Individual Stones N/A

c. Adequacy of Slope Protection Against Waves and Runoff Has a good grass cover, but wave action has been eroding it away.

d. Gradation of Slope Protection - Localized Areas of Fine Material N/A

4. Surface Cracks None were seen

C. Downstream Slope

1. Undesirable Growth or Debris Pine trees, 4" to 5" in diameter were present at toe of slope. One 5" diameter tree, on the slope, and 20' from the toe was located directly above the outlet structure.

2. Slougking, Subsidence, or Depressions; Abnormal Bulges or Non-Uniformity The slope appears to be flatter in section that was rebuilt.

3. Surface Cracks on Face of Slope None were seen.

4. Surface Cracks or Evidence of Heaving at Embankment Toe None were seen.

5. Wet or Saturated Areas or Other Evidence of Seepage on Face of Slope; Evidence of "Piping" or "Boils" At about station 7+00, $\frac{2}{3}$ the way down the slope there is a small wet area. It could be retainage from recent rain rather than seepage.

6. Drainage System There are two toe drains, one on each side of the outlet structure. Two 8" dimeter pipes near the outlet structure are visible, but are about half filled with material. Both had a very small flow coming from these pipes

7. Fill Contact with Outlet Structure Good Riprap was directly below the structure. No evidence of erosion around the structure.

8. Condition of Grass Slope Protection Good grass cover, but cattle are keeping it short. Some areas near crest have been reseeded.

D. Abutments

1. Erosion of Contact of Embankment with Abutment from Surface Water Runoff, Upstream or Downstream

None Evident

2. Springs or Indications of Seepage Along Contact of Embankment with the Abutments None were seen

3. Springs or Indications of Seepage in Areas a Short Distance Downstream of Embankment - Abutment Tie-in

None were seen

II. Area Downstream of Embankment, Including Channel

A. Localized Subsidence, Depressions, Sinkholes, Etc. None were seen

B. Evidence of "Piping", "Boils", or "Seepage" None were seen

C. Unusual Presence of Lush Growth, such as Swamp Grass, etc. None

D. Unusual Muddy Water in Downstream Channel Water was clear.

E. Sloughing or Erosion None were seen

F. Surface Cracks or Evidence of Heaving Beyond Embankment Toe None

G. Stability of Channel Sideslopes Good

H. Condition of Channel Slope Protection Good grass slopes

I. Adequacy of Slope Protection Against Waves, Currents, and Surface Runoff Good slope protection

J. Miscellaneous

K. Condition of Relief Wells, Drains, and Other Appurtenances N/A

L. Unusual Increase or Decrease in Discharge from Relief Wells N/A

III. Instrumentation

A. Monumentation/Surveys None

B. Observation Wells None

C. Weirs None

D. Piezometers None

E. Other

IV. Spillways

A. Service Spillway (Service/Emergency Combination Yes __ No X)

1. **Intake Structure Condition** Good condition. It has a walk way and a metal cover. A trash rack is on two sides of the square structure providing two, 9.5' by 1' openings. The 5th construction joint from the top is leaking badly and should be repaired.
2. **Outlet Structure Condition** Good condition. A 30" reinforced concrete pipe empties into a 25' diameter stilling basin. The basin slopes are protected by concrete slabs and riprap is directly beneath the outflow.
3. **Pipe Condition** Excellent condition
4. **Evidence of Leakage or Piping** None was evident.
5. **General Remarks** Depth of water in the 30" pipe was about 5". Flow was about 180 gpm.

B. Emergency Spillway

1. **General Condition** Good condition
2. **Entrance Channel** Entrance channel is about 1½' above normal pool. It is well grassed although some water was standing.
3. **Control Section** The control section runs parallel to the dam exiting in front of the right abutment. It crosses the paved access road.

3. Exit Channel The exitchannel is wide and well grassed It slopes at 2 to 3% for about 250 feet then drops off to a gully.

4. Vegetative/Woody Cover Well grassed cover.

5. Other Observations

V. Emergency Drawdown Facilities (if part of service spillway so state) A gate valve on the service spillway controls an 18" diameter opening.

Are Facilities Operable: Yes X No _____

Were Facilities Operated During Inspection: Yes _____ No X

Date Facilities Were Last Used _____

VI. Reservoir

A. Slopes Grass slopes around half of reservoir and steep wooded slopes are around the other half of the reservoir.

B. Sedimentation None evident

C. Turbidity None

VII. Drainage Area

Description (for hydrologic analysis) Heavily wooded with very steep topography.

A. Changes in Land Use None expected

VIII. Downstream Area (Stream)

A. Condition (obstructions, debris, etc.) Channel passes through a small culvert 200' downstream and through another under the paved road ½ mile downstream. No major obstructions.

B. Slopes Area downstream is gently sloping pasture land.

C. Approximate No. Homes, Population, and Distance D/S

One house and one store about ½ mile downstream. The population varies from 3 to 6 people depending upon the people at the store.

D. Other Hazards A barn is next to the house and could possibly be damaged.

IX. Miscellaneous

Incidents/Failures A failure occured in October of 1963. The cause of the failure is unknown, although it is believed that a 6" diameter pipe coming through the dam caused failure. No loss of life and damage was minimal.

Observed Geology of Area

X. Conclusions

The dam appears to be well constructed and in good condition.

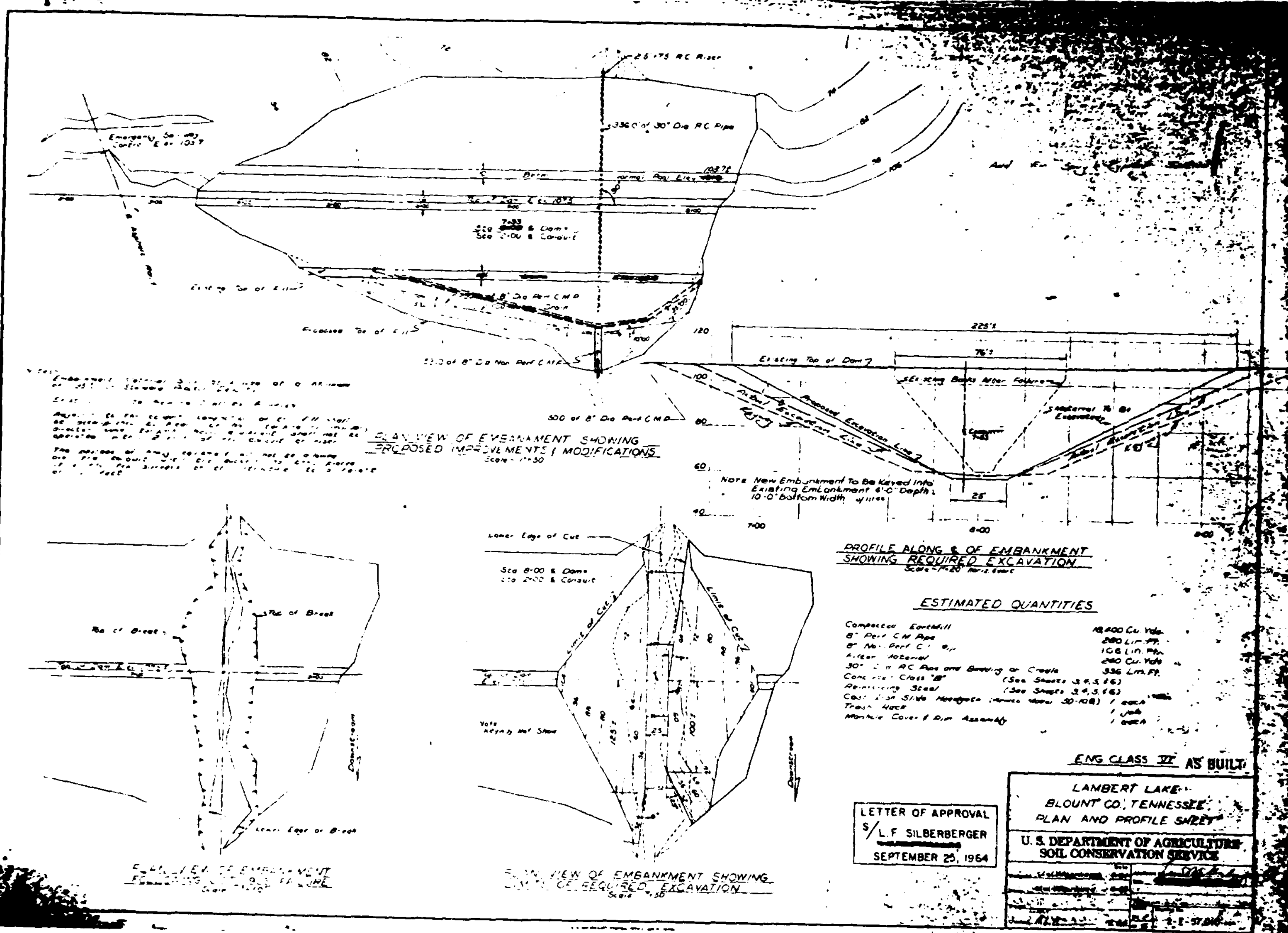
XI. Recommendations

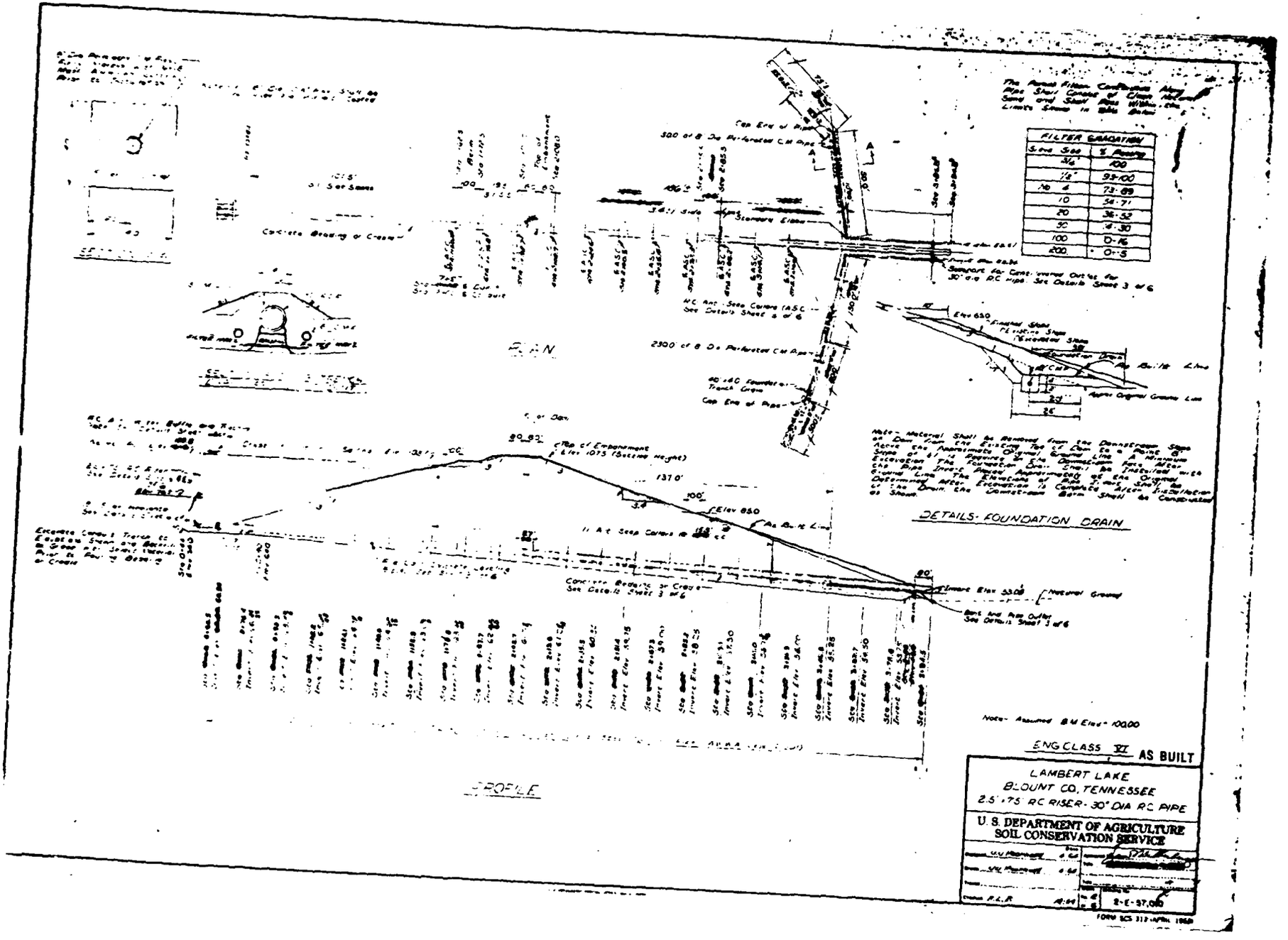
Regional Engineer

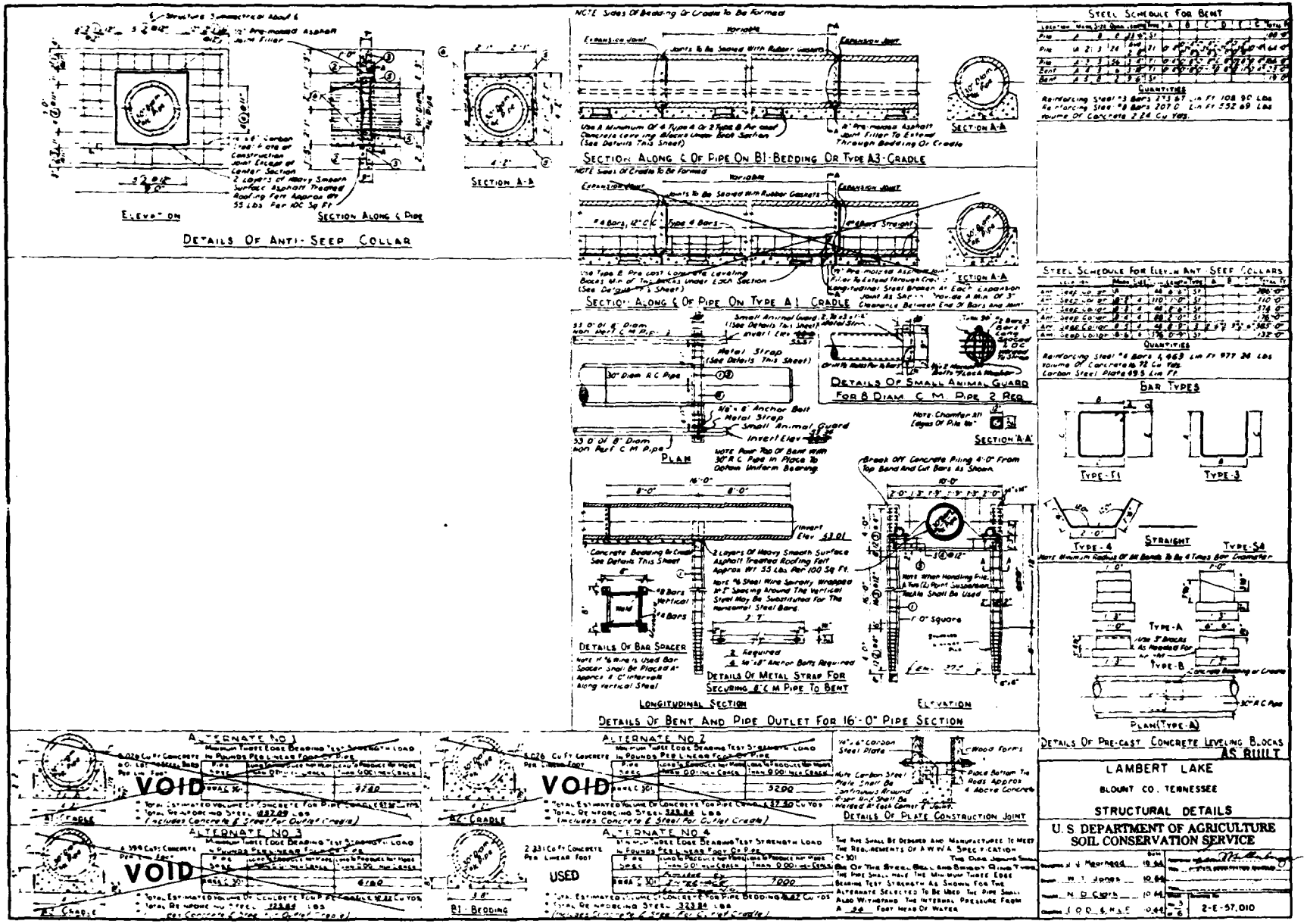
Chief Engineer

APPENDIX E

DESIGN DRAWINGS


2.5'x7.5' RC Riser
336.0' of 30" Dia RC Pipe
Emergency Spillway
Crest El 103.7
Berm
Existing Top of Fill
8" Dia Perf CMP
Proposed Top of Fill
500 of 8" Dia Perf CMP
PLAN VIEW OF EMBANKMENT SHOWING
PROPOSED IMPROVEMENTS & MODIFICATIONS
Scale 1"=50
225'±
76'±
Existing Top of Dam
Existing Banks After Failure
Proposed Excavation Line
Material To Be Excavated
Note: New Embankment To Be Keyed Into Existing Embankment 6'-0" Depth; 10'-0" Bottom Width
25
120
100
80
60
40
7+00
8+00
9+00
PROFILE ALONG ℄ OF EMBANKMENT
SHOWING REQUIRED EXCAVATION
Scale 1"=20' Horiz.
Toe of Break
Lower Edge of Break
Downstream
Lower Edge of Cut
Sta 8+00 ℄ Dam
Limit of Cut
Note: Keyway Not Shown
PLAN VIEW OF EMBANKMENT SHOWING
LIMITS OF REQUIRED EXCAVATION
Scale 1"=50
ESTIMATED QUANTITIES
Compacted Earthfill 18,400 Cu. Yds.
8" Perf CM Pipe 280 Lin. Ft.
Filter Material 240 Cu. Yds.
30" RC Pipe and Bedding or Cradle 336 Lin. Ft.
Concrete Class "B" (See Sheets 3, 4, 5, & 6)
Reinforcing Steel (See Sheets 3, 4, 5, & 6)
Trash Rack 1 job
Manhole Cover & Rim Assembly 1 each
ENG CLASS VI AS BUILT
LAMBERT LAKE
BLOUNT CO., TENNESSEE
PLAN AND PROFILE SHEET
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
LETTER OF APPROVAL
S/ L.F. SILBERBERGER
SEPTEMBER 25, 1964


FILTER GRADATION
Sieve Size
% Passing
3/4"
100
1/2"
95-100
No. 4
73-89
10
54-71
20
36-52
30
21-30
100
0-16
200
0-5
PLAN
DETAILS- FOUNDATION DRAIN
PROFILE
ENG CLASS VI AS BUILT
LAMBERT LAKE
BLOUNT CO, TENNESSEE
2.5' x 7.5' RC RISER- 30" DIA RC PIPE
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



LAMBERT LAKE

BLOUNT CO. TENNESSEE

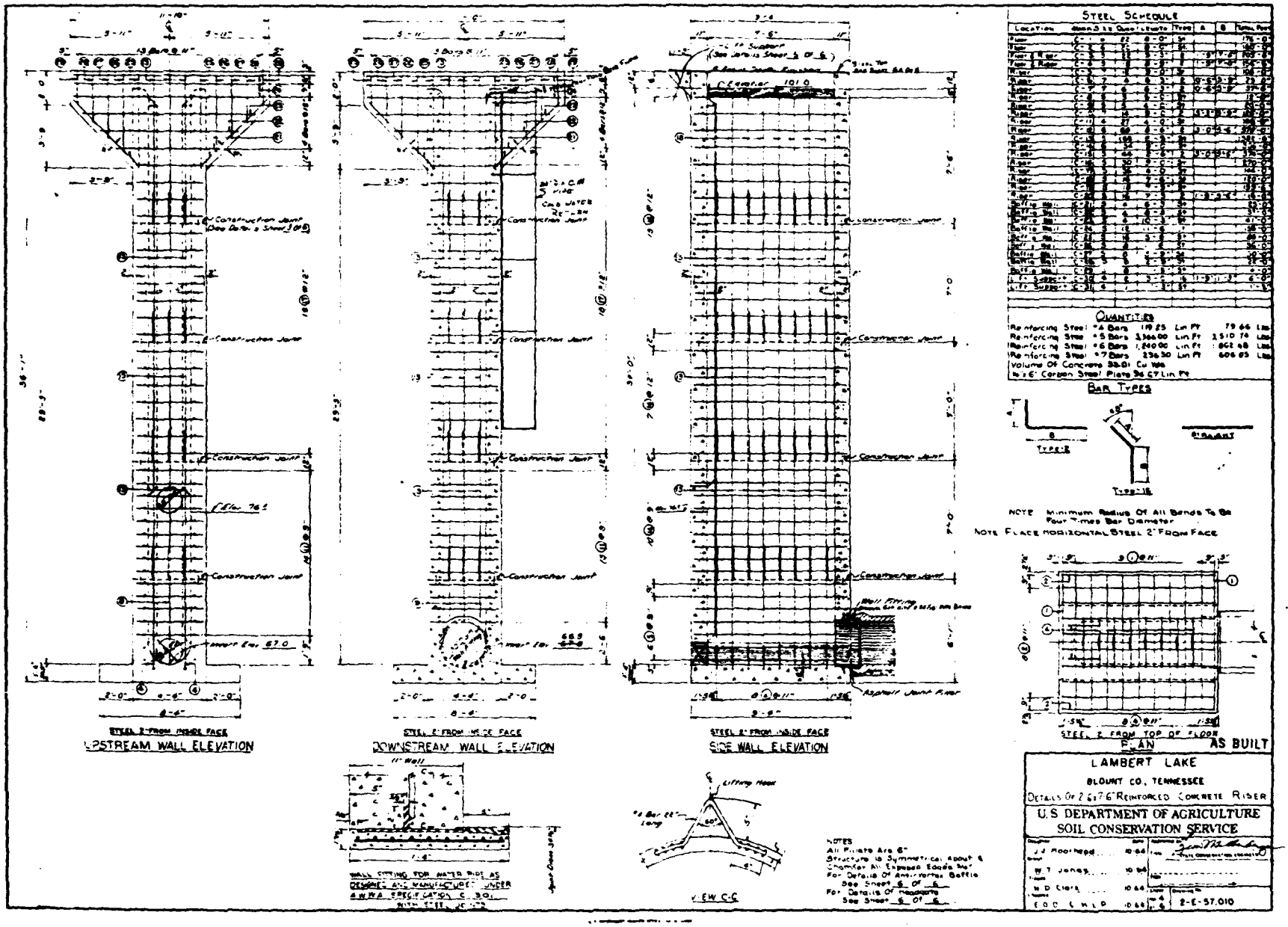
STRUCTURAL DETAILS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	J. J. Mearhoff	10-44
Drawn	M. T. Jones	10-44
Traced	N. D. Cobb	10-44
Checked	J. O. D. & H. L. F.	10-44

Sheet No. 3 of 6 Sheets

Drawing No. 2-E-57,010



LAMBERT LAKE

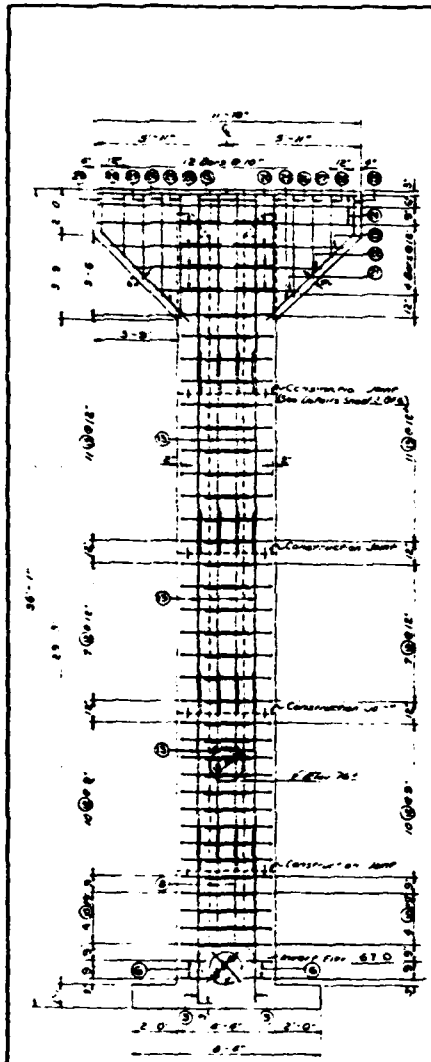
BLOUNT CO., TENNESSEE

Details Of 2 6 x 7 6" Reinforced Concrete Riser

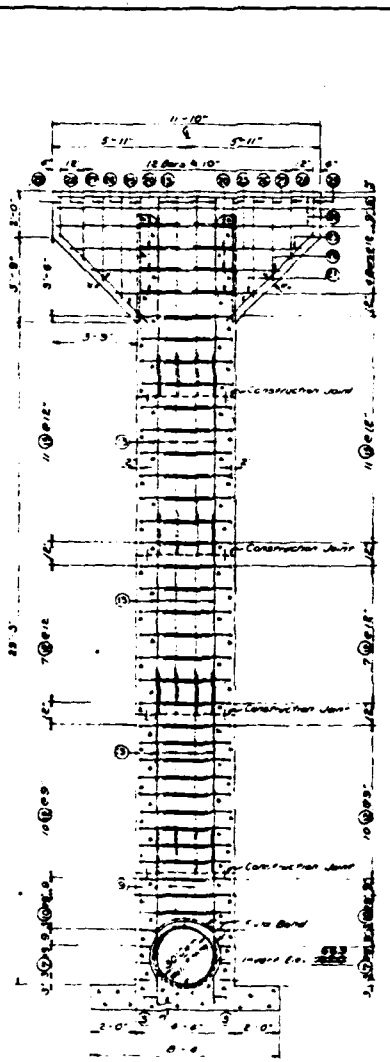
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

J.J. Moorhead	10-64	
W.T. Jones	10-64	
H.D. Clark	10-64	
E.O.C. L.H.L.P.	10-64	Sheet No. 4 of 6

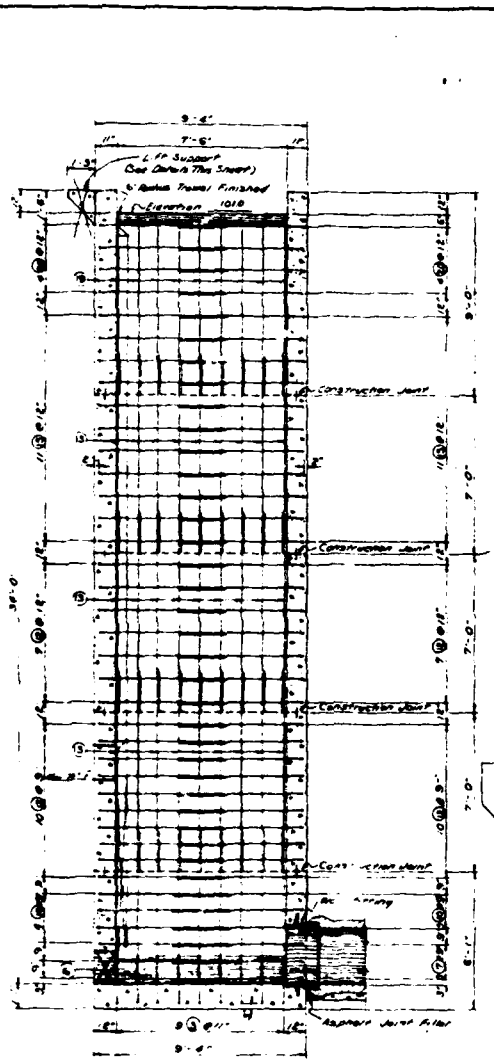
2-E-57.010



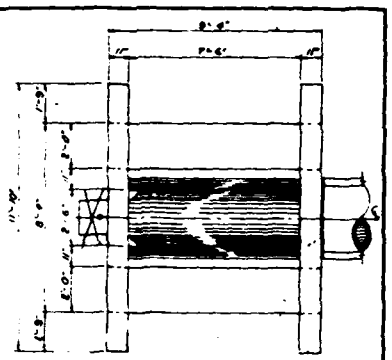
UPSTREAM WALL ELEVATION



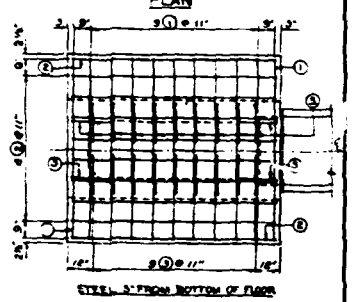
DOWNSTREAM WALL ELEVATION



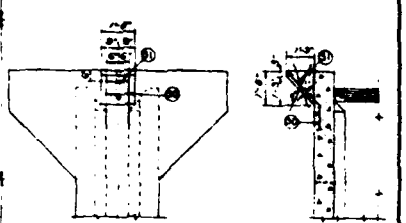
SIDE WALL ELEVATION



PLAN



PLAN



DETAILS OF LIFT SUPPORT

AS BUILT

LAMBERT LAKE

BLOUNT CO., TENNESSEE

DETAILS OF 2'-6" x 7'-6" REINFORCED CONCRETE RISER

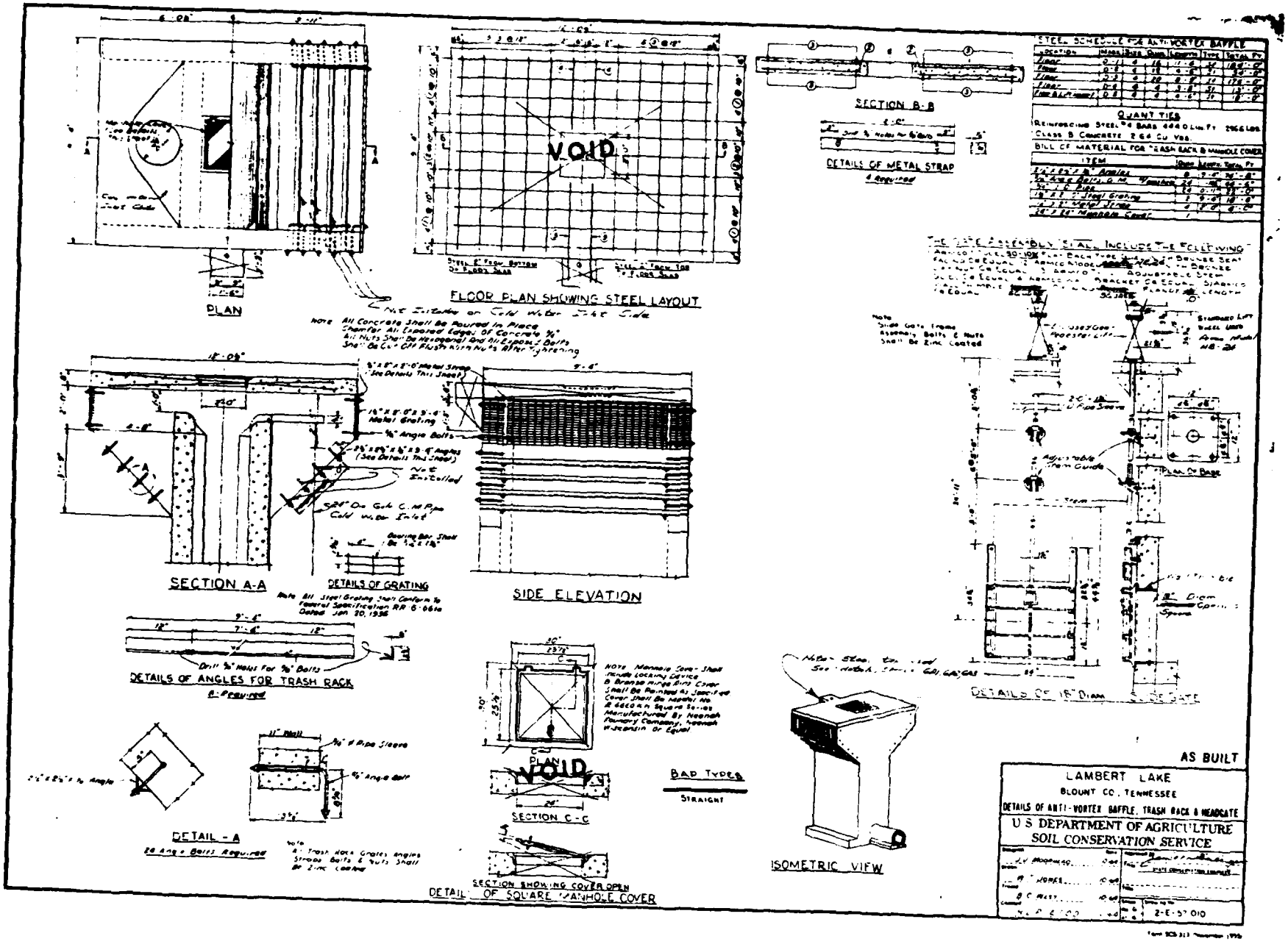
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed	J.V.	Date	10-66
Drawn	W.T.	Date	10-66
Traced	D.C. WEST	Date	10-66
Checked	H.L.P. & E.O.D.	Date	10-66

Approved: [illegible]

Sheet No. 5 of 6

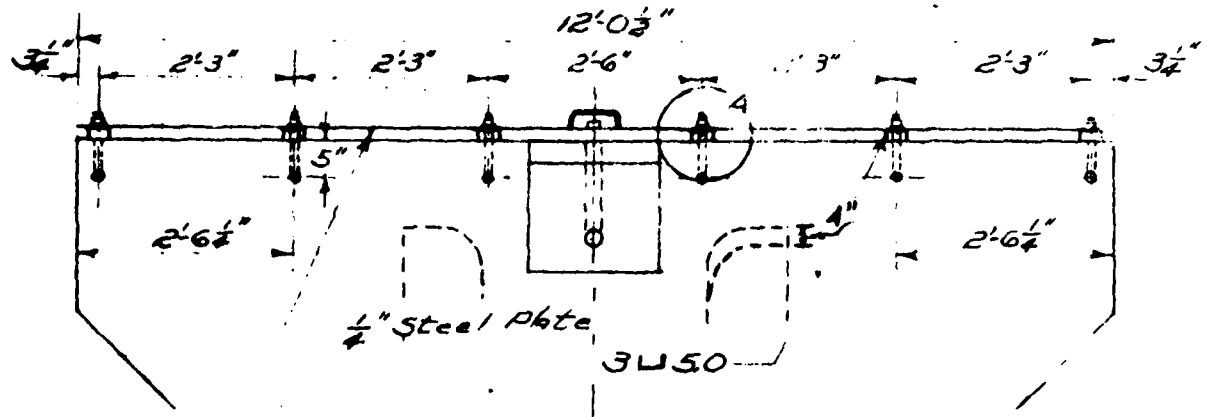
2-E-57.010


PLAN
FLOOR PLAN SHOWING STEEL LAYOUT
VOID
SECTION B-B
DETAILS OF METAL STRAP
4 Required
STEEL SCHEDULE FOR ANTI-VORTEX BAFFLE
QUANTITIES
Reinforcing Steel 96 Bars 6640 Lin. Ft 2966 Lbs.
Class B Concrete 2.64 Cu. Yds.
BILL OF MATERIAL FOR TRASH RACK & MANHOLE COVER
Note All Concrete Shall Be Poured In Place
Chamfer All Exposed Edges Of Concrete ¾"
All Nuts Shall Be Hexagonal And All Expans. Bolts
Shall Be Cut Off Flush With Nuts After Tightening
SECTION A-A
DETAILS OF GRATING
SIDE ELEVATION
DETAILS OF ANGLES FOR TRASH RACK
8 Required
DETAIL - A
28 Ang. x Bolts Required
PLAN
SECTION C-C
SECTION SHOWING COVER OPEN
DETAIL OF SQUARE MANHOLE COVER
BAP TYPES
STRAIGHT
ISOMETRIC VIEW
DETAILS OF 18" Diam
AS BUILT
LAMBERT LAKE
BLOUNT CO., TENNESSEE
DETAILS OF ANTI-VORTEX BAFFLE, TRASH RACK & HEADGATE
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
2-E-57.010

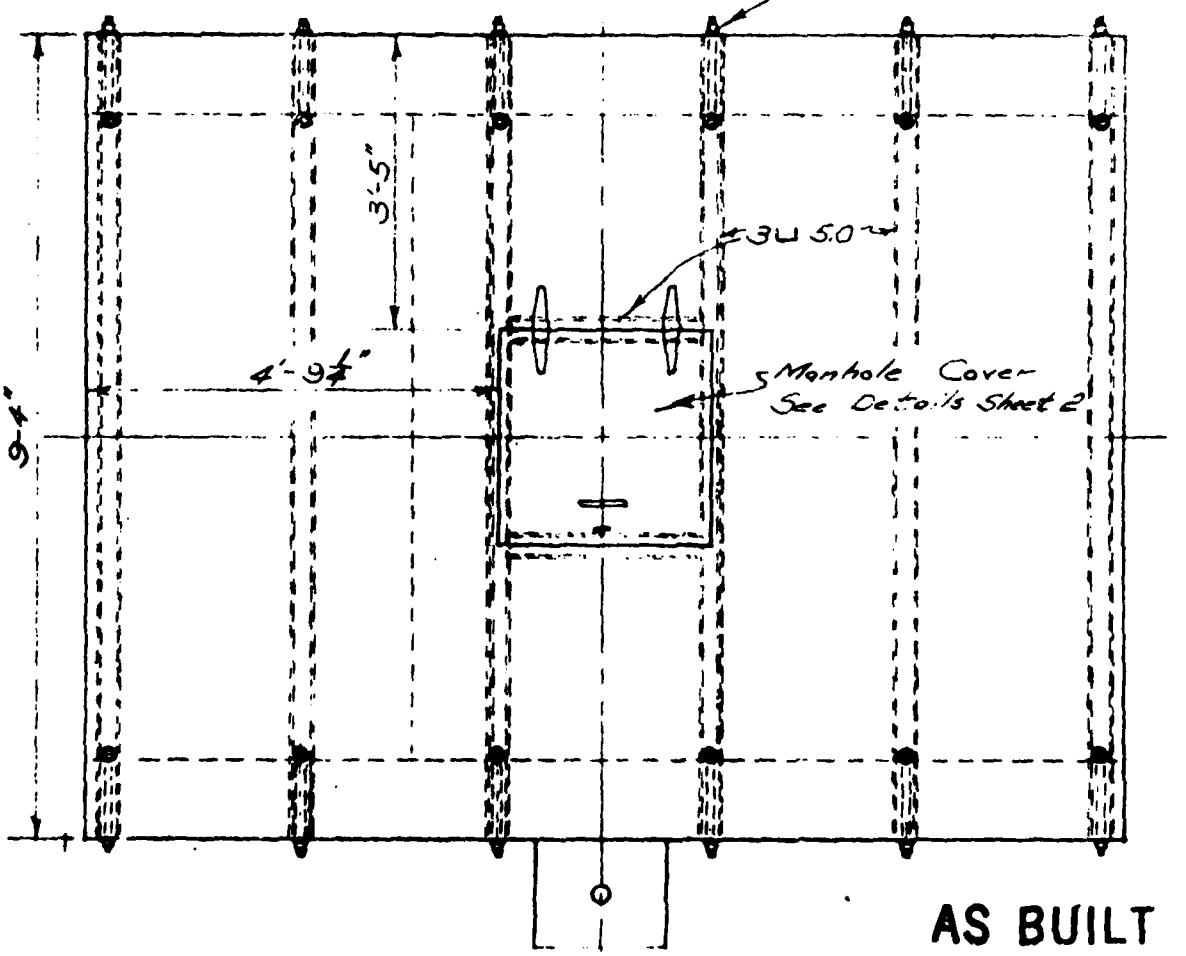
STATE TENNESSEE PROJECT LAMBERT LAKE

C.C.M. 10-28-64

STEEL COVER FOR 2.5' x 7.5' R.C. RISER



ELEVATION



PLAN

AS BUILT

SHEET 6A1 OF 6

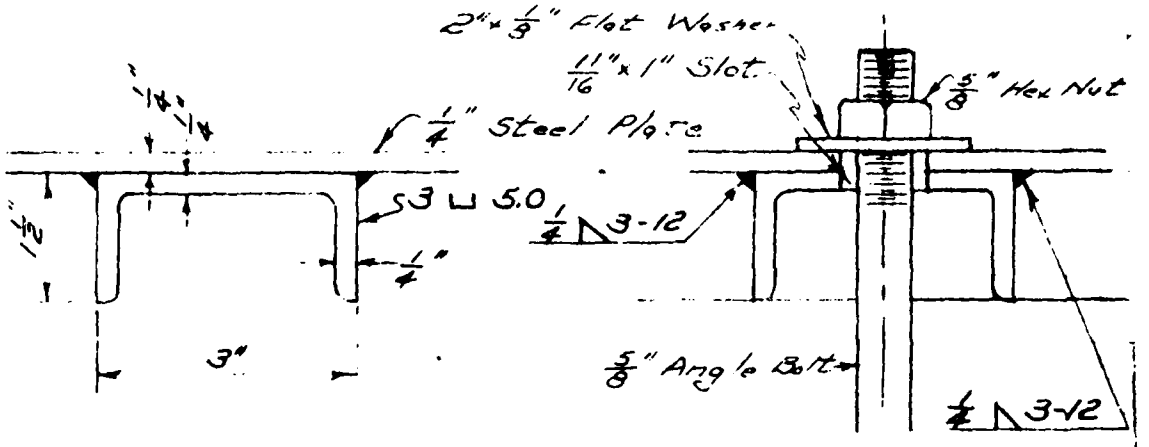
COMPILATION SHEET

SCS 593A REV 6-68

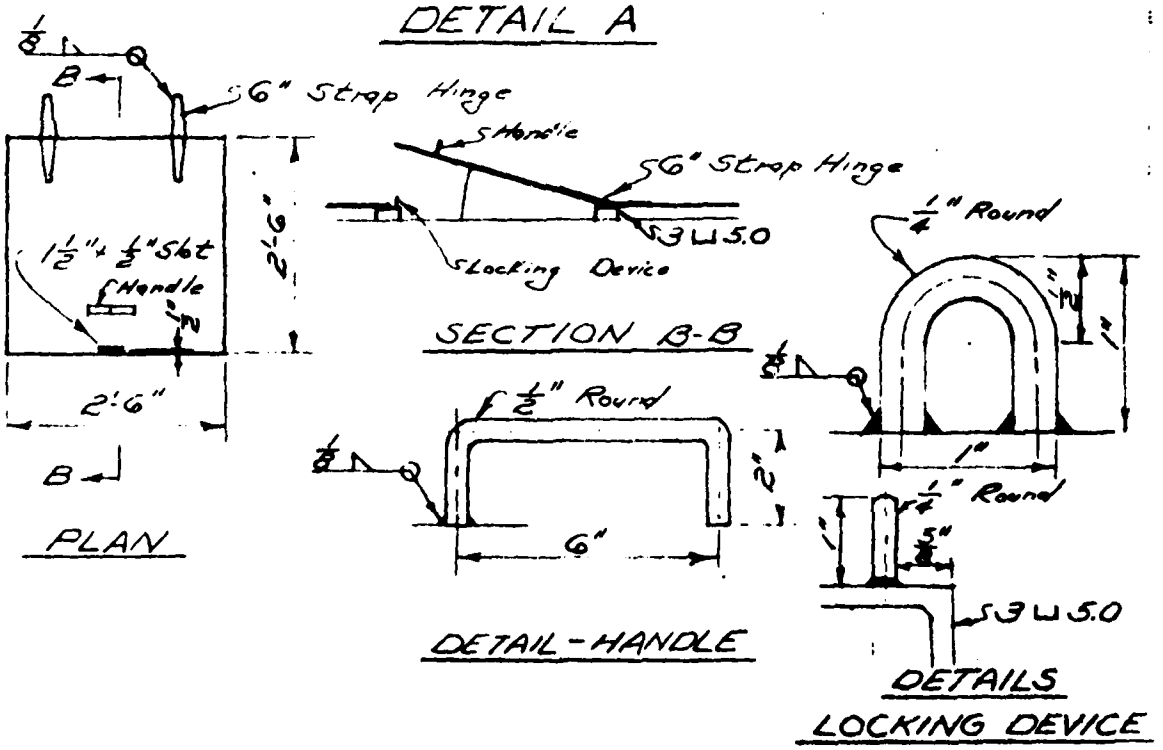
TENNESSEE "LAMBERT LAKE

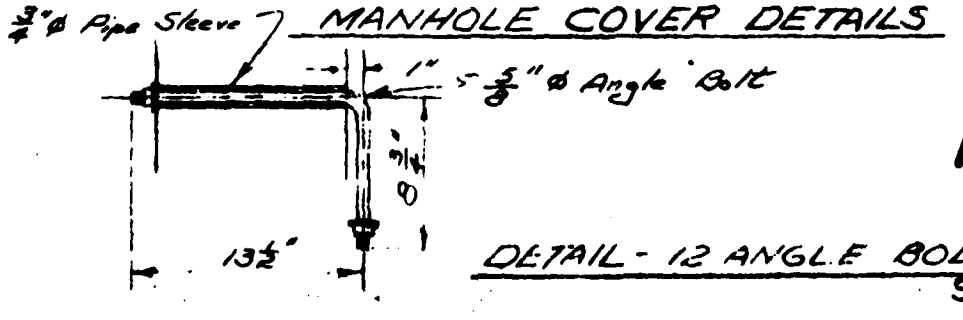
J.C.M. 10-28-64

STEEL COVER FOR 2.5' x 7.5' R.C. RISER



DETAIL A





AS BUILT

DETAIL - 12 ANGLE BOLTS REQ'D

SHEET 6A2 OF 6

SOIL CONSERVATION SERVICE

STATE TENNESSEE LAMBERT LAKE

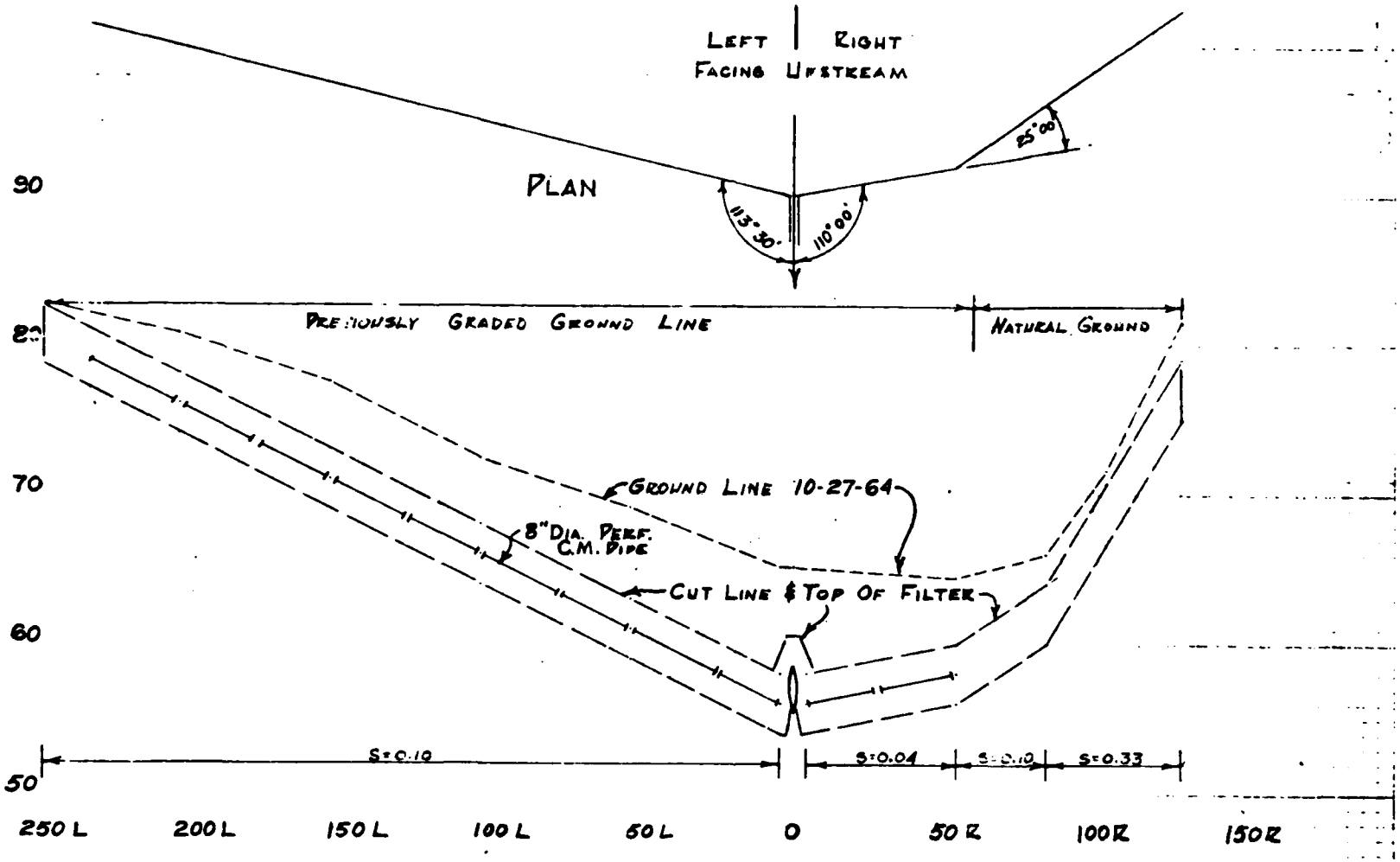
J.J.M 10-24-64

STEEL COVER FOR 2.5'x7.5' R.C. RISER 3 3

BILL OF MATERIALS

ITEM	DESCRIPTION	QUAN.
1	12'-0½" x 3'-4" x ¼" Steel Plate	1
2	3 L 5.0, 9'-4" long	6
3	3 L 5.0, 2'-3" long	2
4	⅞" Dia. Angle Bolts, 13½" - 8¾"	12
5	¾" I.D. Pipe Sleeve, 11" long	12
6	6" x ⅛" Strap Hinge, Steel	2
7	Handle - 10" of ½" ø Round	1
8	Locking Device - 3½" of ¼" Round	1
9	2" x ⅛" Flat Washers - ⅝" ø Hole	12
10	⅝" ø Flat Washers - Standard	12
11	⅝" ø Hex Nuts -	24
12	Padlock	1

AS BUILT



PROFILE LOOKING UPSTREAM

PROFILE OF 4'x4'
FOUNDATION DRAIN
LAMBERT LAKE

AS BUILT

SHEET 2A

APPENDIX F

HYDRAULIC AND HYDROLOGIC ANALYSIS

HYDROLOGIC AND HYDRAULIC ANALYSIS

According to OCL guidelines, Lambert Dam must be able to safely pass the Probable Maximum Flood (PMF). Six-hour rainfall depths for the Probable Maximum Precipitation (PMP) and the 100-year rainfall were obtained from the U. S. Weather Service's Technical Paper 40. Flood routings were performed using the HEC-1-DB computer program. The program used the dimensionless hydrograph technique described in Section 4 of the Soil Conservation Service National Engineering Handbook and the Modified Puls method of reservoir routing.

The peak outflow from the PMF is 3584 CFS, which overtops the dam for 4.75 hours at a maximum depth of 1.32 feet.

LAMBERT DAM (BLOUNT CO)

SUMMARY OF ROUTINGS

Spillway design flood	Antecedent Moisture Condition	
	AMC II	AMC III
PMF	Overtops by 1.32' for 4.75 hrs.	Overtops by 1.32' for 4.75 hrs.
½PMF	Overtops by 0.65' for 3.00 hrs.	Overtops by 0.65' for 3.00 hrs.
100 YR	2.2 ' freeboard	1.6' freeboard

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION     JULY 1978
 LAST MODIFICATION  01 APR 80
**********
    1          A1   LAKE LAMBERT DAM
    2          A2   SAFE DAM INSPECTION AMCIII
    3          A3   MAY 1981   TNP
    4          B    150       0         15        0         0         0         0         0         0         0
    5          B1   5
    6          J    1         3         1
    7          J1   1         .5        .14
    8          K                1                                    1                   1
    9          K1   LOCAL RUNOFF COMPUTATION
   10          M    1         2         .732                 .732      1
   11          P              38.0      75        90        100                   -1        -88
   12          T
   13          W2             1.18
   14          X    10        100       2
   15          K    1         1                                    1                   1
   16          K1   ROUTING COMPUTATION
   17          Y                                                  1                   -1        -1
   18          Y1   1
   19          Y4   1059      1060      1061      1062      1063      1064      1064.5
   20          Y5   0         42        102       138       262       543       743
   21          S8   336       351       379       400       422       443       456
   22          SE   1059      1060      1061      1062      1063      1064      1064.5
   23          SS1061.8
   24          SD1064.5       2.0       1.5       .05
   25          K    99
```

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT 1
ROUTE HYDROGRAPH TO 1
END OF NETWORK

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
 LAST MODIFICATION  01 APR 80
**********

RUN  DATE= 81/08/25.
     TIME= 09.15.02.
```

LAKE LAMBERT DAM
SAFE DAM INSPECTION AMCIII
MAY 1981 TWP

JOB SPECIFICATION

NW	NMR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
150	0	13	0	0	0	0	0	0	0

JOPER	NNT	LROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 3 LRTIO= 1

RTIOS= 1.00 .50 .16

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

LOCAL RUNOFF COMPUTATION

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	1	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUNG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	.73	0.00	.73	1.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	38.00	79.00	90.00	100.00	0.00	0.00	0.00

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	-1.00	-88.00	0.00	0.00

CURVE NO = -88.00 WETNESS = -1.00 EFFECT CN = 88.00

UNIT HYDROGRAPH DATA
TC= 0.00 LAG= 1.18

RECESSION DATA
STRTQ= 10.00 QRCSN= 100.00 RTIOR= 2.00

UNIT HYDROGRAPH 26 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= 1.18 VOL= 1.00

26.	79.	166.	242.	270.	260.	224.	174.	120.	87.
65.	48.	35.	26.	19.	14.	10.	7.	5.	4.

	5.	6.	2.	1.	1.	0.							
						END-OF-PERIOD FLOW							
MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1.01	.15	1	.06	0.00	.06	9.	1.01	19.00	76	.10	.09	.00	1393.
1.01	.30	2	.06	0.00	.06	9.	1.01	19.15	77	.10	.09	.00	1135.
1.01	.45	3	.06	0.00	.06	8.	1.01	19.30	78	.10	.09	.00	904.
1.01	1.00	4	.06	0.00	.06	8.	1.01	19.45	79	.10	.09	.00	712.
1.01	1.15	5	.06	.00	.06	7.	1.01	20.00	80	.10	.09	.00	564.
1.01	1.30	6	.06	.01	.06	7.	1.01	20.15	81	.10	.09	.00	461.
1.01	1.45	7	.06	.01	.05	7.	1.01	20.30	82	.10	.09	.00	386.
1.01	2.00	8	.06	.02	.05	8.	1.01	20.45	83	.10	.09	.00	330.
1.01	2.15	9	.06	.02	.04	11.	1.01	21.00	84	.10	.09	.00	290.
1.01	2.30	10	.06	.02	.04	14.	1.01	21.15	85	.10	.09	.00	259.
1.01	2.45	11	.06	.03	.04	19.	1.01	21.30	86	.10	.09	.00	236.
1.01	3.00	12	.06	.03	.04	24.	1.01	21.45	87	.10	.09	.00	219.
1.01	3.15	13	.06	.03	.03	29.	1.01	22.00	88	.10	.09	.00	206.
1.01	3.30	14	.06	.03	.03	35.	1.01	22.15	89	.10	.09	.00	198.
1.01	3.45	15	.06	.03	.03	40.	1.01	22.30	90	.10	.09	.00	192.
1.01	4.00	16	.06	.04	.03	45.	1.01	22.45	91	.10	.09	.00	188.
1.01	4.15	17	.06	.04	.03	50.	1.01	23.00	92	.10	.09	.00	185.
1.01	4.30	18	.06	.04	.02	54.	1.01	23.15	93	.10	.09	.00	183.
1.01	4.45	19	.06	.04	.02	58.	1.01	23.30	94	.10	.09	.00	182.
1.01	5.00	20	.06	.04	.02	62.	1.01	23.45	95	.10	.09	.00	180.
1.01	5.15	21	.06	.04	.02	66.	1.02	0.00	96	.10	.09	.00	180.
1.01	5.30	22	.06	.04	.02	69.	1.02	.15	97	0.00	0.00	0.00	177.
1.01	5.45	23	.06	.04	.02	72.	1.02	.30	98	0.00	0.00	0.00	169.
1.01	6.00	24	.06	.05	.02	75.	1.02	.45	99	0.00	0.00	0.00	154.
1.01	6.15	25	.24	.18	.06	80.	1.02	1.00	100	0.00	0.00	0.00	131.
1.01	6.30	26	.24	.19	.05	93.	1.02	1.15	101	0.00	0.00	0.00	105.
1.01	6.45	27	.24	.19	.04	118.	1.02	1.30	102	0.00	0.00	0.00	95.
1.01	7.00	28	.24	.20	.04	154.	1.02	1.45	103	0.00	0.00	0.00	88.
1.01	7.15	29	.24	.20	.03	195.	1.02	2.00	104	0.00	0.00	0.00	82.
1.01	7.30	30	.24	.21	.03	236.	1.02	2.15	105	0.00	0.00	0.00	77.
1.01	7.45	31	.24	.21	.03	273.	1.02	2.30	106	0.00	0.00	0.00	72.
1.01	8.00	32	.24	.21	.02	304.	1.02	2.45	107	0.00	0.00	0.00	67.
1.01	8.15	33	.24	.22	.02	328.	1.02	3.00	108	0.00	0.00	0.00	62.
1.01	8.30	34	.24	.22	.02	347.	1.02	3.15	109	0.00	0.00	0.00	58.
1.01	8.45	35	.24	.22	.02	363.	1.02	3.30	110	0.00	0.00	0.00	54.
1.01	9.00	36	.24	.22	.02	375.	1.02	3.45	111	0.00	0.00	0.00	51.
1.01	9.15	37	.24	.22	.01	386.	1.02	4.00	112	0.00	0.00	0.00	47.
1.01	9.30	38	.24	.22	.01	394.	1.02	4.15	113	0.00	0.00	0.00	44.
1.01	9.45	39	.24	.23	.01	401.	1.02	4.30	114	0.00	0.00	0.00	41.
1.01	10.00	40	.24	.23	.01	407.	1.02	4.45	115	0.00	0.00	0.00	38.
1.01	10.15	41	.24	.23	.01	411.	1.02	5.00	116	0.00	0.00	0.00	36.
1.01	10.30	42	.24	.23	.01	415.	1.02	5.15	117	0.00	0.00	0.00	33.
1.01	10.45	43	.24	.23	.01	419.	1.02	5.30	118	0.00	0.00	0.00	31.
1.01	11.00	44	.24	.23	.01	422.	1.02	5.45	119	0.00	0.00	0.00	29.
1.01	11.15	45	.24	.23	.01	424.	1.02	6.00	120	0.00	0.00	0.00	27.
1.01	11.30	46	.24	.23	.01	426.	1.02	6.15	121	0.00	0.00	0.00	25.
1.01	11.45	47	.24	.23	.01	428.	1.02	6.30	122	0.00	0.00	0.00	24.
1.01	12.00	48	.24	.23	.01	430.	1.02	6.45	123	0.00	0.00	0.00	22.
1.01	12.15	49	.71	.69	.02	443.	1.02	7.00	124	0.00	0.00	0.00	21.
1.01	12.30	50	.71	.70	.02	461.	1.02	7.15	125	0.00	0.00	0.00	19.
1.01	12.45	51	.71	.70	.01	559.	1.02	7.30	126	0.00	0.00	0.00	18.
1.01	13.00	52	.71	.70	.01	672.	1.02	7.45	127	0.00	0.00	0.00	17.
1.01	13.15	53	.86	.84	.01	803.	1.02	8.00	128	0.00	0.00	0.00	16.
1.01	13.30	54	.86	.84	.01	937.	1.02	8.15	129	0.00	0.00	0.00	15.
1.01	13.45	55	.86	.85	.01	1006.	1.02	8.30	130	0.00	0.00	0.00	14.

1.01	14.00	56	.86	.85	.01	1184.	1.02	8.45	131	0.00	0.00	0.00	13.
1.01	14.15	57	1.07	1.06	.01	1285.	1.02	9.00	132	0.00	0.00	0.00	12.
1.01	14.30	58	1.07	1.06	.01	1382.	1.02	9.15	133	0.00	0.00	0.00	11.
1.01	14.45	59	1.07	1.06	.01	1481.	1.02	9.30	134	0.00	0.00	0.00	10.
1.01	15.00	60	1.07	1.06	.01	1581.	1.02	9.45	135	0.00	0.00	0.00	10.
1.01	15.15	61	1.08	1.08	.01	1674.	1.02	10.00	136	0.00	0.00	0.00	9.
1.01	15.30	62	2.17	2.16	.01	1784.	1.02	10.15	137	0.00	0.00	0.00	8.
1.01	15.45	63	6.06	6.05	.02	2038.	1.02	10.30	138	0.00	0.00	0.00	8.
1.01	16.00	64	1.52	1.51	.00	2461.	1.02	10.45	139	0.00	0.00	0.00	7.
1.01	16.15	65	1.00	1.00	.00	3039.	1.02	11.00	140	0.00	0.00	0.00	7.
1.01	16.30	66	1.00	1.00	.00	3509.	1.02	11.15	141	0.00	0.00	0.00	6.
1.01	16.45	67	1.00	1.00	.00	3679.	1.02	11.30	142	0.00	0.00	0.00	6.
1.01	17.00	68	1.00	1.00	.00	3602.	1.02	11.45	143	0.00	0.00	0.00	6.
1.01	17.15	69	.78	.78	.00	3349.	1.02	12.00	144	0.00	0.00	0.00	5.
1.01	17.30	70	.78	.78	.00	2995.	1.02	12.15	145	0.00	0.00	0.00	5.
1.01	17.45	71	.78	.78	.00	2624.	1.02	12.30	146	0.00	0.00	0.00	4.
1.01	18.00	72	.78	.78	.00	2353.	1.02	12.45	147	0.00	0.00	0.00	4.
1.01	18.15	73	.10	.09	.00	2130.	1.02	13.00	148	0.00	0.00	0.00	4.
1.01	18.30	74	.10	.09	.00	1906.	1.02	13.15	149	0.00	0.00	0.00	4.
1.01	18.45	75	.10	.09	.00	1658.	1.02	13.30	150	0.00	0.00	0.00	3.
									SUM	38.00	36.41	1.59	69974.
										(965.)	(925.)	(40.)	(1981.44)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3679.	2093.	720.	466.	69969.
CMS	104.	59.	20.	13.	1981.
INCHES		26.60	36.58	37.05	37.05
MM		675.55	929.10	941.04	941.04
AC-FT		1038.	1427.	1446.	1446.
THOUS CU M		1280.	1761.	1783.	1783.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

9.	9.	8.	8.	7.	7.	7.	8.	11.	14.
19.	24.	29.	35.	40.	45.	50.	54.	58.	62.
66.	69.	72.	75.	80.	93.	118.	154.	199.	236.
273.	304.	328.	347.	363.	375.	386.	394.	401.	407.
411.	415.	419.	422.	424.	426.	428.	430.	443.	481.
559.	672.	803.	937.	1066.	1184.	1285.	1382.	1481.	1581.
1674.	1784.	2038.	2461.	3039.	3509.	3679.	3602.	3349.	2995.
2624.	2353.	2130.	1906.	1658.	1393.	1135.	904.	712.	564.
461.	388.	330.	290.	259.	238.	219.	208.	198.	192.
186.	185.	183.	182.	180.	180.	177.	169.	154.	131.
105.	95.	88.	82.	77.	72.	67.	62.	58.	54.
51.	47.	44.	41.	38.	36.	33.	31.	29.	27.
25.	24.	22.	21.	19.	18.	17.	16.	15.	14.
13.	12.	11.	10.	10.	9.	8.	8.	7.	7.
6.	6.	6.	5.	5.	4.	4.	4.	4.	3.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3679.	2093.	720.	466.	69969.
CMS	104.	59.	20.	13.	1981.
INCHES		26.60	36.58	37.05	37.05
MM		675.55	929.10	941.04	941.04
AC-FT		1038.	1427.	1446.	1446.
THOUS CU M		1280.	1761.	1783.	1783.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

5.	4.	4.	4.	4.	3.	4.	4.	5.	7.
9.	12.	15.	17.	20.	23.	25.	27.	29.	31.
33.	34.	36.	37.	40.	47.	59.	77.	97.	118.
137.	152.	164.	174.	181.	188.	193.	197.	200.	203.
206.	208.	209.	211.	212.	213.	214.	215.	221.	240.
279.	336.	401.	468.	533.	592.	643.	691.	740.	791.
837.	892.	1019.	1231.	1519.	1754.	1840.	1801.	1674.	1498.
1312.	1177.	1065.	953.	829.	696.	568.	452.	356.	282.
231.	193.	165.	145.	130.	118.	109.	103.	99.	96.
94.	93.	92.	91.	90.	90.	88.	85.	77.	65.
53.	47.	44.	41.	38.	36.	33.	31.	29.	27.
25.	24.	22.	21.	19.	18.	17.	16.	15.	14.
13.	12.	11.	10.	10.	9.	8.	8.	7.	7.
6.	6.	6.	5.	5.	4.	4.	4.	4.	3.
3.	3.	3.	3.	3.	2.	2.	2.	2.	2.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1840.	1046.	360.	235.	34984.
CMS	52.	30.	10.	7.	991.
INCHES		13.30	18.29	18.52	18.52
MM		337.78	464.55	470.52	470.52
AC-FT		519.	714.	723.	723.
THOUS CU M		640.	880.	892.	892.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 3

1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
3.	3.	4.	5.	6.	6.	7.	8.	8.	9.
9.	10.	10.	10.	11.	13.	17.	22.	27.	33.
38.	43.	46.	49.	51.	53.	54.	55.	56.	57.
58.	58.	59.	59.	59.	60.	60.	60.	62.	67.
78.	94.	112.	131.	149.	166.	180.	193.	207.	221.
236.	250.	265.	345.	425.	491.	515.	504.	469.	419.
367.	329.	298.	267.	232.	195.	159.	127.	100.	79.
65.	54.	46.	41.	36.	33.	31.	29.	28.	27.
26.	26.	26.	25.	25.	25.	25.	24.	22.	18.
15.	13.	12.	12.	11.	10.	9.	9.	8.	8.
7.	7.	6.	6.	5.	5.	5.	4.	4.	4.
4.	3.	3.	3.	3.	3.	2.	2.	2.	2.
2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	515.	293.	101.	65.	9796.
CMS	15.	8.	3.	2.	277.
INCHES		3.72	5.12	5.19	5.19
MM		94.58	130.07	131.75	131.75
AC-FT		145.	200.	202.	202.
THOUS CU M		179.	246.	250.	250.

6

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HYDROGRAPH ROUTING

RESERVOIR ROUTING

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	1	0	1	0	1	0	0

ROUTING DATA

CLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1.	-1

STAGE	1059.00	1060.00	1061.00	1062.00	1063.00	1064.00	1064.50
FLOW	0.00	42.00	102.00	138.00	262.00	583.00	743.00
CAPACITY=	336.	357.	379.	400.	422.	443.	454.
ELEVATION=	1059.	1060.	1061.	1062.	1063.	1064.	1065.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
1061.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
1064.5	2.6	1.5	605.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	1.	1.	1.	2.	2.	2.	2.	3.	3.
3.	4.	5.	6.	7.	9.	10.	12.	14.	16.
18.	20.	22.	24.	26.	28.	32.	36.	41.	51.
62.	74.	88.	101.	110.	119.	128.	138.	165.	191.
215.	237.	257.	290.	323.	348.	367.	382.	395.	411.
438.	481.	583.	647.	768.	1033.	1211.	1325.	1427.	1529.
1627.	1730.	1918.	2273.	2804.	3345.	3638.	3841.	3885.	3120.
2764.	2456.	2221.	2003.	1772.	1522.	1273.	1046.	858.	732.
663.	587.	521.	470.	423.	380.	343.	311.	285.	263.
254.	247.	240.	234.	228.	223.	218.	213.	207.	200.
191.	181.	171.	162.	153.	144.	137.	135.	132.	130.
127.	124.	121.	119.	116.	113.	111.	108.	105.	102.
98.	94.	91.	87.	83.	80.	76.	73.	70.	67.
64.	61.	58.	56.	53.	51.	48.	46.	44.	42.
41.	39.	38.	37.	35.	34.	33.	32.	31.	29.

STORAGE

336.	336.	337.	337.	337.	337.	337.	337.	337.	337.
338.	338.	339.	339.	340.	340.	341.	342.	343.	344.
345.	346.	347.	348.	349.	350.	352.	354.	357.	360.
364.	369.	374.	379.	384.	389.	394.	400.	405.	409.
414.	418.	421.	424.	427.	428.	430.	431.	432.	433.
435.	436.	438.	440.	455.	459.	462.	463.	464.	465.
466.	467.	469.	472.	477.	481.	483.	483.	482.	479.
476.	474.	472.	470.	468.	465.	462.	460.	457.	453.
450.	445.	441.	438.	434.	431.	428.	426.	424.	422.
421.	419.	418.	417.	416.	415.	414.	413.	412.	411.
409.	408.	406.	404.	403.	401.	400.	398.	397.	395.

394.	392.	390.	389.	387.	385.	384.	382.	381.	379.
378.	376.	375.	373.	372.	371.	370.	368.	367.	366.
365.	364.	363.	362.	361.	360.	359.	359.	358.	357.
356.	356.	355.	354.	354.	353.	352.	352.	351.	351.

STAGE

1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.1	1059.1	1059.1
1059.1	1059.1	1059.1	1059.1	1059.2	1059.2	1059.2	1059.3	1059.3	1059.4
1059.4	1059.5	1059.5	1059.6	1059.6	1059.7	1059.8	1059.9	1060.0	1060.1
1060.3	1060.5	1060.8	1061.0	1061.2	1061.5	1061.7	1062.0	1062.2	1062.4
1062.6	1062.8	1063.0	1063.1	1063.2	1063.3	1063.4	1063.4	1063.5	1063.5
1063.6	1063.8	1064.0	1064.3	1064.5	1064.7	1064.9	1064.9	1065.0	1065.0
1065.1	1065.1	1065.2	1065.3	1065.5	1065.7	1065.8	1065.8	1065.8	1065.6
1065.5	1065.4	1065.3	1065.2	1065.1	1065.0	1064.9	1064.8	1064.6	1064.5
1064.3	1064.1	1063.9	1063.7	1063.6	1063.4	1063.3	1063.2	1063.1	1063.0
1062.9	1062.9	1062.8	1062.8	1062.7	1062.7	1062.6	1062.6	1062.6	1062.5
1062.4	1062.3	1062.3	1062.2	1062.1	1062.0	1062.0	1061.9	1061.8	1061.8
1061.7	1061.6	1061.5	1061.5	1061.4	1061.3	1061.2	1061.2	1061.1	1061.0
1060.9	1060.9	1060.8	1060.7	1060.7	1060.6	1060.6	1060.5	1060.5	1060.4
1060.4	1060.3	1060.3	1060.2	1060.2	1060.1	1060.1	1060.1	1060.0	1060.0
1060.0	1059.9	1059.9	1059.9	1059.8	1059.8	1059.8	1059.8	1059.7	1059.7

PEAK OUTFLOW IS 3641. AT TIME 17.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3641.	2081.	706.	462.	69267.
CMS	103.	59.	20.	13.	1961.
INCHES		26.45	35.87	36.68	36.68
MM		671.72	911.03	931.60	931.60
AC-FT		1032.	1400.	1431.	1431.
THOUS CU M		1273.	1726.	1765.	1765.

STATION 1, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
2.	2.	3.	3.	4.	4.	5.	6.	7.	8.
9.	10.	11.	12.	13.	14.	16.	18.	21.	24.
28.	33.	38.	44.	51.	59.	68.	73.	80.	86.
93.	99.	104.	106.	111.	115.	118.	122.	125.	129.
133.	142.	167.	197.	230.	272.	356.	431.	500.	571.
648.	716.	835.	1065.	1347.	1632.	1801.	1821.	1735.	1584.
1408.	1253.	1133.	1025.	910.	805.	723.	656.	576.	506.
445.	389.	338.	293.	259.	244.	230.	218.	204.	192.
181.	172.	163.	155.	148.	141.	137.	136.	134.	131.
129.	126.	123.	121.	118.	115.	112.	109.	107.	104.
101.	97.	93.	89.	85.	81.	78.	74.	71.	68.
65.	62.	59.	57.	54.	52.	49.	47.	45.	43.
41.	40.	38.	37.	36.	34.	33.	32.	31.	30.
29.	28.	27.	26.	25.	24.	23.	22.	21.	21.

STORAGE

330.	330.	330.	330.	330.	330.	330.	337.	337.	337.
337.	337.	337.	338.	338.	338.	339.	339.	339.	340.
340.	341.	341.	342.	343.	343.	344.	345.	346.	346.

[illegible]	353.	[illegible]	358.	[illegible]	363.	366.	366.	371.	375.
378.	378.	382.	382.	384.	386.	388.	390.	392.	395.
397.	401.	405.	410.	416.	423.	429.	435.	440.	445.
448.	453.	456.	460.	463.	466.	468.	468.	467.	466.
464.	462.	461.	459.	458.	456.	453.	449.	445.	440.
436.	431.	428.	424.	421.	419.	416.	414.	412.	410.
408.	406.	404.	403.	402.	401.	400.	399.	397.	396.
395.	393.	391.	390.	388.	387.	385.	383.	382.	380.
378.	377.	376.	374.	373.	371.	370.	369.	368.	367.
365.	364.	363.	362.	361.	361.	360.	359.	358.	357.
357.	356.	355.	355.	354.	353.	353.	352.	351.	351.
350.	350.	349.	349.	348.	348.	348.	347.	347.	346.

STAGE

1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0
1059.0	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.2	1059.2
1059.2	1059.2	1059.3	1059.3	1059.3	1059.3	1059.4	1059.4	1059.5	1059.6
1059.7	1059.8	1059.9	1060.0	1060.2	1060.3	1060.4	1060.5	1060.6	1060.7
1060.8	1061.0	1061.1	1061.2	1061.3	1061.4	1061.5	1061.5	1061.6	1061.7
1061.9	1062.0	1062.2	1062.5	1062.7	1063.0	1063.3	1063.6	1063.8	1064.1
1064.3	1064.4	1064.6	1064.8	1064.9	1065.1	1065.1	1065.1	1065.1	1065.0
1065.0	1064.9	1064.8	1064.7	1064.7	1064.6	1064.5	1064.3	1064.1	1063.9
1063.7	1063.5	1063.3	1063.1	1063.0	1062.9	1062.7	1062.6	1062.5	1062.4
1062.3	1062.3	1062.2	1062.1	1062.1	1062.0	1062.0	1061.9	1061.9	1061.8
1061.7	1061.7	1061.6	1061.5	1061.4	1061.4	1061.3	1061.2	1061.1	1061.1
1061.0	1060.9	1060.8	1060.8	1060.7	1060.7	1060.6	1060.5	1060.5	1060.4
1060.4	1060.3	1060.3	1060.2	1060.2	1060.2	1060.1	1060.1	1060.0	1060.0
1060.0	1059.9	1059.9	1059.9	1059.9	1059.8	1059.8	1059.8	1059.7	1059.7
1059.7	1059.7	1059.6	1059.6	1059.6	1059.6	1059.5	1059.5	1059.5	1059.5

PEAK OUTFLOW IS 1821. AT TIME 17.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1821.	1005.	350.	230.	38494.
CMS	52.	28.	10.	7.	977.
INCHES		12.77	17.77	18.26	18.26
MM		324.30	451.43	463.93	463.93
AC-FT		632.	693.	713.	713.
THOUS CU M		615.	855.	879.	

STATION 1, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	1.	1.	1.	1.	1.	1.	2.	2.	2.
2.	3.	3.	3.	4.	4.	4.	5.	6.	7.
8.	9.	11.	12.	14.	15.	17.	18.	20.	21.
23.	24.	26.	27.	28.	29.	31.	32.	33.	34.
36.	38.	41.	44.	50.	56.	62.	69.	76.	84.
92.	100.	106.	114.	123.	135.	148.	206.	237.	260.
289.	304.	306.	300.	288.	270.	255.	243.	229.	213.
196.	183.	168.	154.	142.	135.	132.	128.	125.	121.
118.	115.	112.	109.	106.	103.	99.	95.	91.	87.
84.	81.	78.	75.	69.	66.	63.	60.	57.	54.
52.	49.	47.	45.	43.	41.	39.	38.	37.	35.

34.	33.	32.	30.	29.	28.	27.	26.	25.	24.
23.	23.	22.	21.	20.	19.	19.	18.	17.	17.
16.	15.	15.	14.	14.	13.	13.	12.	12.	11.

STORAGE

330.	330.	330.	330.	330.	330.	330.	330.	330.	330.
330.	330.	330.	330.	337.	337.	337.	337.	337.	337.
337.	337.	330.	330.	338.	338.	338.	339.	339.	339.
340.	341.	341.	342.	343.	344.	344.	345.	346.	347.
347.	348.	349.	349.	350.	351.	351.	352.	353.	353.
354.	355.	356.	358.	360.	362.	364.	367.	369.	372.
375.	378.	382.	386.	391.	398.	405.	412.	418.	422.
424.	425.	425.	425.	424.	423.	421.	419.	416.	413.
411.	408.	405.	403.	401.	398.	396.	394.	392.	390.
388.	387.	385.	383.	381.	380.	378.	377.	375.	374.
372.	371.	369.	368	367.	366.	365.	364.	363.	362.
361.	360.	359.	358.	357.	356.	356.	355.	354.	354.
353.	352.	352.	351.	351.	350.	350.	349.	349.	348.
348.	347.	347.	347.	346.	346.	345.	345.	345.	344.
344.	344.	343.	343.	343.	343.	342.	342.	342.	342.

STAGE

1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0
1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.1
1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.2
1059.2	1059.2	1059.3	1059.3	1059.3	1059.4	1059.4	1059.4	1059.5	1059.5
1059.5	1059.6	1059.6	1059.6	1059.7	1059.7	1059.7	1059.8	1059.8	1059.8
1059.9	1059.9	1060.0	1060.0	1060.1	1060.2	1060.3	1060.4	1060.6	1060.7
1060.8	1061.0	1061.1	1061.3	1061.6	1061.9	1062.2	1062.5	1062.8	1063.0
1063.1	1063.1	1063.2	1063.1	1063.1	1063.0	1062.9	1062.8	1062.7	1062.6
1062.5	1062.4	1062.2	1062.1	1062.0	1061.9	1061.8	1061.7	1061.6	1061.5
1061.4	1061.4	1061.3	1061.2	1061.1	1061.0	1061.0	1060.9	1060.8	1060.8
1060.7	1060.6	1060.6	1060.5	1060.5	1060.4	1060.3	1060.3	1060.3	1060.2
1060.2	1060.1	1060.1	1060.0	1060.0	1060.0	1059.9	1059.9	1059.9	1059.8
1059.8	1059.8	1059.8	1059.7	1059.7	1059.7	1059.6	1059.6	1059.6	1059.6
1059.6	1059.5	1059.5	1059.5	1059.5	1059.5	1059.4	1059.4	1059.4	1059.4
1059.4	1059.4	1059.4	1059.3	1059.3	1059.3	1059.3	1059.3	1059.3	1059.3

PEAK OUTFLOW IS 300. AT TIME 18.25 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	306.	211.	95.	68.	9527.
CMS	9.	6.	3.	2.	270.
INCHES		2.66	4.83	5.04	5.04
MM		68.15	122.78	128.14	128.14
AC-FT		105.	189.	197.	197.
THOUS CU M		129.	233.	243.	243.

10

********** ********** ********** ********** **********

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1 1.00	RATIO 2 .50	RATIOS APPLIED TO FLOWS RATIO 3 .14
HYDROGRAPH AT	1	.73	1	3679.	1840.	515.
	(	1.90)	(	104.19)(	52.09)(	14.59)(
ROUTED TO	1	.73	1	3041.	1521	300.
	(	1.90)	(	103.10)(	51.50)(	8.47)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1059.00	1061.60	1064.50
STORAGE	336.	396.	454.
OUTFLOW	0.	131.	743.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	1065.81	1.31	483.	3041.	6.25	17.00	0.00
.50	1065.15	.65	408.	1821.	3.50	17.00	0.00
.14	1063.16	0.00	425.	306.	0.00	18.25	0.00

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION        JULY 1978
  LAST MODIFICATION  01 APR 81
**********
    1                 A1                    LAKE LAMBERT DAM
    2                 A2              SAFF DAM INSPECTION AMCII
    3                 A3                    MAY 1981   TRP
    4                 B     150       0       15        0        0        0        0        0        0        0
    5                 P1      5
    6                 J       1       5       1
    7                 J1      1      .5      .11
    8                 K                     1                                  1
    9                 K1                    LOCAL RUNOFF COMPUTATION
   10                 M       1       2     .732                      .732     1
   11                 P             38.0      75       90      100
   12                 T                                                  -1     -75
   13                 M2            1.18
   14                 X      10     100       2
   15                 K       1       1                                  1
   16                 K1                    ROUTING COMPUTATION
   17                 T                                 1        1
   18                 V1      1                                          -1     -1
   19                 V4   1059    1060      1061     1062     1063     1064   1064.5
   20                 V5      0      42       102      138      262      543     743
   21                 S5    336     357       379      400      422      443     858
   22                 S4   1059    1060      1061     1062     1063     1064   1064.5
   23                 ST1061.8
   24                 SD1064.5     2.6       1.5      .05
   25                 K      99
```

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

HUNDEE HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	1

END OF NETWORK

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 01 APR 80
****

RUN DATE= 81/08/25.
TIME= 08.20.33.

LAKE LAMBERT DAM
SAFF DAM INSPECTION AMCII
MAY 1981 TNP

JOB SPECIFICATION

NO	NMR	NMTN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
150	0	15	0	0	0	0	0	0	0

	JOPER	NW	LROPT	TRACE
	5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 3 LRTIO= 1

RTIOS= 1.00 .50 .11

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

LOCAL RUNOFF COMPUTATION

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	1	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	2	.73	0.00	.73	1.00	0.000	0	0	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	38.00	75.00	90.00	100.00	0.00	0.00	0.00

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	-1.00	-75.00	0.00	0.00

CURVE NO = -75.00 WETNESS = -1.00 EFFECT CN = 75.00

UNIT HYDROGRAPH DATA
TC= 0.00 LAG= 1.18

RECESSION DATA
STRTQ= 10.00 QRCSN= 100.00 RTIOR= 2.00

UNIT HYDROGRAPH 26 END OF PERIOD ORDINATES, TC= 0.00 HOURS, LAG= 1.18 VOL= 1.00

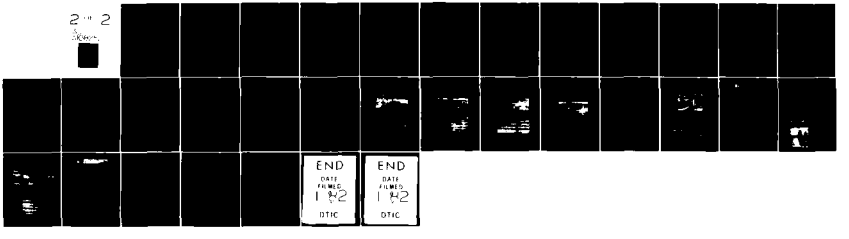
26.	79.	166.	242.	270.	260.	224.	174.	120.	87.
65.	48.	35.	26.	19.	14.	10.	7.	5.	4.

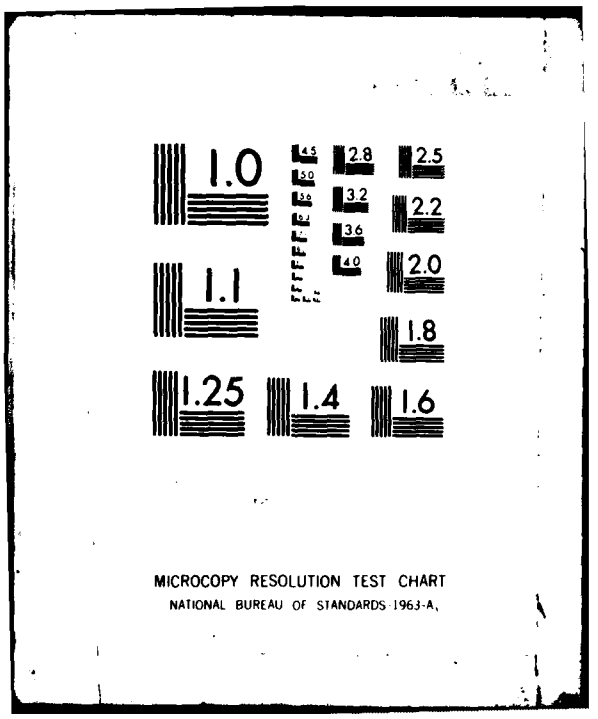
	3.	2.	4.	1.	1.	0.						
						END-OF-PERIOD FLOW						
MO,DA	HR,MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO,DA	HR,MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
1,01	.15	1	.00	0.00	.00	9.	1,01	19.00	76	.10	.09	.00	1380.
1,01	.30	2	.00	0.00	.00	9.	1,01	19.15	77	.10	.09	.00	1125.
1,01	.45	3	.00	0.00	.00	8.	1,01	19.30	78	.10	.09	.00	896.
1,01	1.00	4	.00	0.00	.00	8.	1,01	19.45	79	.10	.09	.00	706.
1,01	1.15	5	.00	0.00	.00	7.	1,01	20.00	80	.10	.09	.00	560.
1,01	1.30	6	.00	0.00	.00	7.	1,01	20.15	81	.10	.09	.00	458.
1,01	1.45	7	.00	0.00	.00	6.	1,01	20.30	82	.10	.09	.00	383.
1,01	2.00	8	.00	0.00	.00	6.	1,01	20.45	83	.10	.09	.00	328.
1,01	2.15	9	.00	0.00	.00	5.	1,01	21.00	84	.10	.09	.00	288.
1,01	2.30	10	.00	0.00	.00	5.	1,01	21.15	85	.10	.09	.00	258.
1,01	2.45	11	.00	.00	.00	5.	1,01	21.30	86	.10	.09	.00	235.
1,01	3.00	12	.00	.00	.00	4.	1,01	21.45	87	.10	.09	.00	218.
1,01	3.15	13	.00	.00	.00	4.	1,01	22.00	88	.10	.09	.00	205.
1,01	3.30	14	.00	.01	.00	5.	1,01	22.15	89	.10	.09	.00	197.
1,01	3.45	15	.00	.01	.05	6.	1,01	22.30	90	.10	.09	.00	191.
1,01	4.00	16	.00	.01	.05	7.	1,01	22.45	91	.10	.09	.00	187.
1,01	4.15	17	.00	.01	.05	9.	1,01	23.00	92	.10	.09	.00	184.
1,01	4.30	18	.00	.01	.05	12.	1,01	23.15	93	.10	.09	.00	182.
1,01	4.45	19	.00	.02	.05	14.	1,01	23.30	94	.10	.09	.00	180.
1,01	5.00	20	.00	.02	.05	17.	1,01	23.45	95	.10	.09	.00	179.
1,01	5.15	21	.00	.02	.04	20.	1,02	0.00	96	.10	.09	.00	179.
1,01	5.30	22	.00	.02	.04	23.	1,02	.15	97	0.00	.00	0.00	176.
1,01	5.45	23	.00	.02	.04	26.	1,02	.30	98	0.00	0.00	0.00	168.
1,01	6.00	24	.00	.02	.04	29.	1,02	.45	99	0.00	0.00	0.00	153.
1,01	6.15	25	.24	.10	.14	53.	1,02	1.00	100	0.00	0.00	0.00	130.
1,01	6.30	26	.24	.11	.13	42.	1,02	1.15	101	0.00	0.00	0.00	104.
1,01	6.45	27	.24	.12	.12	58.	1,02	1.30	102	0.00	0.00	0.00	95.
1,01	7.00	28	.24	.13	.10	81.	1,02	1.45	103	0.00	0.00	0.00	88.
1,01	7.15	29	.24	.14	.10	108.	1,02	2.00	104	0.00	0.00	0.00	82.
1,01	7.30	30	.24	.15	.09	138.	1,02	2.15	105	0.00	0.00	0.00	77.
1,01	7.45	31	.24	.16	.08	167.	1,02	2.30	106	0.00	0.00	0.00	72.
1,01	8.00	32	.24	.16	.07	194.	1,02	2.45	107	0.00	0.00	0.00	67.
1,01	8.15	33	.24	.17	.07	217.	1,02	3.00	108	0.00	0.00	0.00	62.
1,01	8.30	34	.24	.17	.06	238.	1,02	3.15	109	0.00	0.00	0.00	58.
1,01	8.45	35	.24	.18	.06	257.	1,02	3.30	110	0.00	0.00	0.00	54.
1,01	9.00	36	.24	.18	.06	273.	1,02	3.45	111	0.00	0.00	0.00	51.
1,01	9.15	37	.24	.19	.05	288.	1,02	4.00	112	0.00	0.00	0.00	47.
1,01	9.30	38	.24	.19	.05	301.	1,02	4.15	113	0.00	0.00	0.00	44.
1,01	9.45	39	.24	.19	.05	312.	1,02	4.30	114	0.00	0.00	0.00	41.
1,01	10.00	40	.24	.19	.04	323.	1,02	4.45	115	0.00	0.00	0.00	38.
1,01	10.15	41	.24	.20	.04	332.	1,02	5.00	116	0.00	0.00	0.00	36.
1,01	10.30	42	.24	.20	.04	340.	1,02	5.15	117	0.00	0.00	0.00	33.
1,01	10.45	43	.24	.20	.04	348.	1,02	5.30	118	0.00	0.00	0.00	31.
1,01	11.00	44	.24	.20	.03	354.	1,02	5.45	119	0.00	0.00	0.00	29.
1,01	11.15	45	.24	.21	.03	360.	1,02	6.00	120	0.00	0.00	0.00	27.
1,01	11.30	46	.24	.21	.03	366.	1,02	6.15	121	0.00	0.00	0.00	25.
1,01	11.45	47	.24	.21	.03	371.	1,02	6.30	122	0.00	0.00	0.00	24.
1,01	12.00	48	.24	.21	.03	376.	1,02	6.45	123	0.00	0.00	0.00	22.
1,01	12.15	49	.71	.64	.06	391.	1,02	7.00	124	0.00	0.00	0.00	21.
1,01	12.30	50	.71	.65	.07	468.	1,02	7.15	125	0.00	0.00	0.00	19.
1,01	12.45	51	.71	.65	.06	543.	1,02	7.30	126	0.00	0.00	0.00	18.
1,01	13.00	52	.71	.66	.05	611.	1,02	7.45	127	0.00	0.00	0.00	17.
1,01	13.15	53	.48	.43	.05	736.	1,02	8.00	128	0.00	0.00	0.00	16.
1,01	13.30	54	.24	.21	.03	765.	1,02	8.15	129	0.00	0.00	0.00	15.
1,01	13.45	55	.24	.21	.04	912.	1,02	8.30	130	0.00	0.00	0.00	14.

16

AD-A108 252 TENNESSEE STATE DEPT OF CONSERVATION NASHVILLE DIV O--ETC F/G 13/13
NATIONAL PROGRAM OF INSPECTION OF NON-FEDERAL DAMS, TENNESSEE, --ETC(U)
SEP 81 P F BLUHM DACW62-81-C-0056

UNCLASSIFIED NL

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1.1
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5.0
5.6
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

1.01	14.00	56	.86	.82	.04	1148.	1.02	8.45	131	0.00	0.00	0.00	13.
1.01	14.15	57	1.07	1.03	.04	1211.	1.02	9.00	132	0.00	0.00	0.00	12.
1.01	14.30	58	1.07	1.03	.04	1309.	1.02	9.15	133	0.00	0.00	0.00	11.
1.01	14.45	59	1.07	1.04	.03	1411.	1.02	9.30	134	0.00	0.00	0.00	10.
1.01	15.00	60	1.07	1.04	.03	1514.	1.02	9.45	135	0.00	0.00	0.00	10.
1.01	15.15	61	1.08	1.04	.03	1610.	1.02	10.00	136	0.00	0.00	0.00	9.
1.01	15.30	62	2.17	2.12	.05	1763.	1.02	10.15	137	0.00	0.00	0.00	8.
1.01	15.45	63	6.06	5.97	.10	1978.	1.02	10.30	138	0.00	0.00	0.00	8.
1.01	16.00	64	1.52	1.50	.02	2401.	1.02	10.45	139	0.00	0.00	0.00	7.
1.01	16.15	65	1.00	.99	.01	2976.	1.02	11.00	140	0.00	0.00	0.00	7.
1.01	16.30	66	1.00	.99	.01	3045.	1.02	11.15	141	0.00	0.00	0.00	6.
1.01	16.45	67	1.00	.99	.01	3419.	1.02	11.30	142	0.00	0.00	0.00	6.
1.01	17.00	68	1.00	.99	.01	3548.	1.02	11.45	143	0.00	0.00	0.00	6.
1.01	17.15	69	.78	.78	.01	3302.	1.02	12.00	144	0.00	0.00	0.00	5.
1.01	17.30	70	.78	.78	.01	2956.	1.02	12.15	145	0.00	0.00	0.00	5.
1.01	17.45	71	.78	.78	.01	2593.	1.02	12.30	146	0.00	0.00	0.00	5.
1.01	18.00	72	.78	.78	.01	2327.	1.02	12.45	147	0.00	0.00	0.00	4.
1.01	18.15	73	.10	.09	.00	2108.	1.02	13.00	148	0.00	0.00	0.00	4.
1.01	18.30	74	.10	.09	.00	1886.	1.02	13.15	149	0.00	0.00	0.00	4.
1.01	18.45	75	.10	.09	.00	1643.	1.02	13.30	150	0.00	0.00	0.00	3.
									SUM	38.00	34.27	3.73	65939.
										(965.)	(871.)	(95.)	(1867.18)

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3619.	2044.	681.	440.	65930.
CMS	102.	58.	19.	12.	1867.
INCHES		25.97	34.61	34.91	34.91
MM		659.69	879.01	886.72	886.72
AC-FT		1013.	1350.	1362.	1362.
THOUS CU M		1250.	1666.	1680.	1680.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

9.	9.	8.	8.	7.	7.	6.	6.	5.	5.
5.	4.	4.	5.	6.	7.	9.	12.	14.	17.
20.	23.	26.	29.	33.	42.	58.	81.	108.	138.
167.	194.	217.	238.	257.	273.	288.	301.	312.	323.
332.	340.	348.	354.	360.	366.	371.	376.	391.	428.
503.	611.	736.	865.	992.	1108.	1211.	1309.	1411.	1514.
1610.	1723.	1978.	2401.	2976.	3045.	3619.	3548.	3302.	2956.
2593.	2327.	2108.	1886.	1643.	1380.	1125.	896.	706.	560.
458.	393.	328.	288.	258.	235.	218.	205.	197.	191.
187.	184.	182.	180.	179.	179.	176.	168.	153.	130.
104.	95.	88.	82.	77.	72.	67.	62.	58.	54.
51.	47.	44.	41.	38.	36.	33.	31.	29.	27.
25.	24.	22.	21.	19.	18.	17.	16.	15.	14.
13.	12.	11.	10.	10.	9.	8.	8.	7.	7.
6.	6.	6.	5.	5.	4.	4.	4.	4.	3.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3619.	2044.	681.	440.	65930.
CMS	102.	58.	19.	12.	1867.
INCHES		25.97	34.61	34.91	34.91
MM		659.69	879.01	886.72	886.72
AC-FT		1013.	1350.	1362.	1362.
THOUS CU M		1250.	1666.	1680.	1680.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

5.	4.	4.	4.	4.	5.	5.	5.	5.	3.
6.	6.	6.	6.	5.	4.	5.	6.	7.	9.
10.	11.	13.	14.	17.	21.	29.	40.	54.	69.
84.	97.	109.	119.	128.	137.	144.	150.	156.	161.
166.	170.	174.	177.	180.	183.	186.	188.	195.	214.
251.	300.	360.	435.	496.	554.	606.	655.	706.	757.
805.	862.	919.	1000.	1480.	1723.	1810.	1774.	1651.	1478.
1296.	1164.	1054.	944.	821.	690.	563.	448.	353.	280.
229.	191.	164.	144.	129.	117.	109.	102.	98.	96.
94.	92.	91.	90.	90.	89.	88.	84.	76.	65.
56.	47.	44.	41.	38.	36.	33.	31.	29.	27.
25.	24.	22.	21.	19.	18.	17.	16.	15.	14.
13.	12.	11.	10.	10.	9.	8.	8.	7.	7.
6.	6.	6.	5.	5.	4.	4.	4.	4.	3.
3.	3.	3.	3.	2.	2.	2.	2.	2.	2.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1810.	1022.	340.	220.	32965.
CMS	51.	29.	10.	6.	933.
INCHES		12.99	17.30	17.46	17.46
MM		329.85	439.51	443.36	443.36
AC-FT		507.	675.	681.	681.
THOUS CU M		625.	833.	840.	840.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 3

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	0.	0.	1.	1.	1.	1.	1.	2.	2.
2.	3.	3.	3.	4.	5.	6.	9.	12.	15.
18.	21.	24.	26.	28.	30.	32.	33.	34.	36.
37.	37.	38.	39.	40.	40.	41.	41.	43.	47.
55.	67.	81.	95.	109.	122.	133.	144.	155.	167.
177.	190.	218.	264.	297.	379.	398.	390.	363.	325.
285.	256.	232.	208.	181.	152.	124.	99.	78.	62.
50.	42.	36.	32.	28.	26.	24.	22.	22.	21.
21.	20.	20.	20.	20.	20.	19.	19.	17.	14.
11.	10.	10.	9.	8.	8.	7.	7.	6.	6.
6.	5.	5.	5.	4.	4.	4.	3.	3.	3.
3.	3.	2.	2.	2.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	398.	225.	75.	48.	7252.
CMS	11.	6.	2.	1.	205.
INCHES		2.86	3.81	3.84	3.84
MM		72.57	96.69	97.54	97.54
AC-FT		111.	149.	150.	150.
THOUS CU M		134.	183.	185.	185.

18

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HYDROGRAPH ROUTING

ROUTING COMPUTATION

ISTAO	ICOMP	ICON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	1	0	0	1	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-1.	-1

STAGE	1059.00	1060.00	1061.00	1062.00	1063.00	1064.00	1064.50
FLOW	0.00	82.00	102.00	136.00	262.00	543.00	743.00
CAPACITY=	336.	357.	379.	400.	422.	443.	458.
ELEVATION=	1059.	1060.	1061.	1062.	1063.	1064.	1065.

CREL	SPWID	COOW	EXPW	FLEVL	COOL	CAREA	EXPL
1061.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COOD	EXPD	DAMWID
1064.5	2.6	1.5	605.

STATION 1, PLAN 1, RATIO 1

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	1.	1.	1.	2.	2.	2.	2.	2.	2.
2.	3.	3.	3.	3.	3.	3.	3.	4.	4.
5.	6.	6.	7.	8.	9.	11.	13.	17.	21.
26.	32.	39.	49.	60.	71.	82.	94.	104.	112.
119.	127.	134.	150.	173.	194.	213.	231.	248.	270.
317.	375.	448.	534.	656.	810.	1050.	1243.	1353.	1459.
1561.	1667.	1856.	2211.	2740.	3280.	3576.	3584.	3397.	3085.
2730.	2828.	2198.	1983.	1756.	1509.	1263.	1038.	850.	730.
660.	544.	519.	468.	420.	378.	341.	310.	283.	262.
254.	248.	239.	233.	227.	222.	217.	212.	208.	199.
190.	180.	170.	161.	152.	144.	137.	135.	132.	129.
127.	124.	121.	119.	116.	113.	110.	108.	105.	102.
98.	94.	90.	87.	83.	79.	76.	73.	70.	66.
64.	61.	58.	55.	53.	51.	48.	46.	44.	42.
41.	39.	38.	36.	35.	34.	33.	32.	30.	29.

STORAGE

336.	336.	337.	337.	337.	337.	337.	337.	337.	337.
337.	337.	337.	337.	337.	337.	338.	338.	338.	338.
338.	339.	339.	340.	340.	341.	341.	343.	344.	344.
349.	352.	356.	360.	364.	368.	372.	376.	380.	385.
389.	393.	398.	402.	406.	410.	413.	416.	419.	423.
426.	430.	436.	442.	449.	456.	460.	462.	463.	465.
466.	467.	469.	472.	476.	480.	482.	483.	481.	479.
476.	474.	472.	470.	466.	465.	462.	459.	457.	453.
449.	445.	441.	437.	434.	431.	428.	426.	424.	422.
421.	419.	418.	417.	416.	415.	414.	413.	412.	411.
409.	407.	406.	404.	403.	401.	400.	398.	397.	395.

19

393.	392.	390.	389.	387.	385.	384.	382.	381.	379.
378.	376.	375.	373.	372.	371.	369.	368.	367.	366.
365.	364.	363.	362.	361.	360.	359.	358.	358.	357.
356.	356.	355.	354.	354.	353.	352.	352.	351.	351.

STAGE

1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.1	1059.1	1059.1
1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1
1059.1	1059.1	1059.2	1059.2	1059.2	1059.2	1059.3	1059.3	1059.4	1059.5
1059.6	1059.8	1059.9	1060.1	1060.3	1060.5	1060.7	1060.9	1061.1	1061.3
1061.5	1061.7	1061.9	1062.1	1062.3	1062.5	1062.6	1062.7	1062.9	1063.0
1063.2	1063.4	1063.7	1064.0	1064.3	1064.6	1064.8	1064.9	1064.9	1065.0
1065.0	1065.1	1065.2	1065.3	1065.5	1065.7	1065.8	1065.8	1065.7	1065.6
1065.5	1065.4	1065.3	1065.2	1065.1	1065.0	1064.9	1064.7	1064.6	1064.5
1064.3	1064.1	1063.9	1063.7	1063.6	1063.4	1063.3	1063.2	1063.1	1063.0
1062.9	1062.9	1062.8	1062.8	1062.7	1062.7	1062.6	1062.6	1062.6	1062.5
1062.4	1062.3	1062.3	1062.2	1062.1	1062.0	1062.0	1061.9	1061.8	1061.8
1061.7	1061.6	1061.5	1061.5	1061.4	1061.3	1061.2	1061.2	1061.1	1061.0
1060.9	1060.9	1060.8	1060.7	1060.7	1060.6	1060.6	1060.5	1060.5	1060.4
1060.4	1060.3	1060.3	1060.2	1060.2	1060.1	1060.1	1060.1	1060.0	1060.0
1060.0	1059.9	1059.9	1059.9	1059.8	1059.8	1059.8	1059.8	1059.7	1059.7

PEAK OUTFLOW IS 3584. AT TIME 17.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3584.	2066.	668.	835.	65230.
CMS	101.	57.	19.	12.	1847.
INCHES		25.75	33.03	34.54	34.54
MM		653.95	861.86	877.30	877.30
AC-FT		1005.	1324.	1348.	1348.
THOUS CU M		1239.	1633.	1662.	1662.

STATION 1, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	2.	2.	2.	2.
2.	3.	3.	4.	4.	5.	5.	7.	8.	10.
13.	16.	20.	24.	28.	32.	36.	41.	46.	53.
59.	65.	71.	78.	82.	87.	93.	98.	103.	106.
111.	116.	124.	134.	161.	201.	283.	313.	402.	482.
556.	645.	734.	970.	1301.	1597.	1769.	1792.	1711.	1563.
1391.	1239.	1121.	1015.	908.	799.	720.	652.	573.	504.
443.	387.	336.	292.	258.	243.	229.	216.	203.	191.
181.	171.	162.	154.	147.	141.	137.	135.	133.	131.
129.	126.	123.	120.	118.	115.	112.	109.	106.	104.
100.	96.	92.	88.	85.	81.	78.	74.	71.	68.
65.	62.	59.	57.	54.	52.	49.	47.	45.	43.
41.	40.	38.	37.	36.	34.	33.	32.	31.	30.
29.	28.	27.	26.	25.	24.	23.	22.	21.	21.

STORAGE

336.	336.	336.	336.	336.	336.	336.	337.	337.	337.
337.	337.	337.	337.	337.	337.	337.	337.	337.	337.
337.	337.	336.	336.	336.	338.	339.	339.	340.	341.

385.	384.	388.	388.	350.	352.	350.	350.	350.	361.
385.	383.	387.	370.	372.	374.	370.	377.	379.	381.
344.	387.	392.	397.	403.	411.	419.	426.	43c.	438.
424.	449.	453.	459.	463.	466.	468.	468.	467.	466.
464.	442.	441.	459.	450.	456.	453.	449.	445.	440.
438.	431.	429.	424.	421.	419.	416.	414.	412.	409.
400.	416.	404.	403.	402.	401.	399.	398.	397.	396.
395.	393.	391.	390.	388.	386.	385.	383.	382.	380.
378.	377.	375.	374.	373.	371.	370.	369.	368.	366.
365.	364.	363.	362.	361.	360.	360.	359.	358.	357.
356.	356.	355.	354.	354.	353.	353.	352.	351.	351.

STAGE

1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0
1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.1
1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.1	1059.2	1059.2	1059.2
1059.3	1059.4	1059.5	1059.6	1059.7	1059.8	1059.9	1060.0	1060.1	1060.2
1060.3	1060.4	1060.5	1060.6	1060.7	1060.8	1060.8	1060.9	1061.0	1061.1
1061.2	1061.3	1061.4	1061.5	1061.6	1062.5	1062.8	1063.2	1063.5	1063.8
1064.0	1064.3	1064.5	1064.7	1064.9	1065.0	1065.1	1065.1	1065.1	1065.0
1063.9	1063.9	1063.8	1063.7	1063.7	1064.6	1064.4	1064.3	1064.1	1063.9
1063.6	1063.4	1063.3	1063.1	1063.0	1062.9	1062.7	1062.6	1062.5	1062.4
1062.3	1062.3	1062.2	1062.1	1062.1	1062.0	1062.0	1061.9	1061.9	1061.8
1061.7	1061.7	1061.6	1061.5	1061.4	1061.4	1061.3	1061.2	1061.1	1061.0
1061.0	1060.9	1060.8	1060.8	1060.7	1060.7	1060.6	1060.5	1060.5	1060.4
1060.4	1060.3	1060.3	1060.2	1060.2	1060.2	1060.1	1060.1	1060.0	1060.0
1060.0	1059.9	1059.9	1059.9	1059.8	1059.8	1059.8	1059.8	1059.7	1059.7
1059.7	1059.7	1059.6	1059.6	1059.6	1059.6	1059.5	1059.5	1059.5	1059.5

PEAK OUTFLOW IS 1792. AT TIME 17.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1792.	969.	331.	217.	32476.
CMS	51.	27.	9.	6.	920.
INCHES		12.31	16.82	17.20	17.20
MM		312.63	427.22	436.78	436.78
AC-FT		480.	656.	671.	671.
THOUS CU M		592.	810.	828.	828.

STATION 1, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
3.	8.	4.	5.	6.	7.	8.	9.	10.	11.
12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
22.	24.	26.	28.	31.	35.	38.	43.	48.	55.
61.	66.	75.	84.	90.	107.	117.	126.	135.	152.
169.	180.	187.	191.	191.	188.	185.	175.	165.	155.
144.	136.	133.	130.	126.	123.	119.	116.	113.	110.
106.	103.	100.	95.	91.	87.	84.	80.	77.	73.
70.	67.	64.	61.	58.	55.	53.	50.	48.	45.
43.	41.	40.	38.	37.	36.	34.	33.	32.	31.

31.	29.	28.	27.	26.	25.	24.	23.	22.	21.
20.	20.	19.	18.	17.	17.	16.	16.	15.	14.
14.	13.	13.	12.	12.	11.	11.	10.	10.	10.

STORAGE

330.	330.	330.	330.	330.	330.	330.	330.	330.	330.
330.	330.	330.	330.	330.	330.	330.	330.	330.	330.
330.	330.	330.	330.	330.	330.	330.	330.	330.	330.
337.	330.	334.	339.	339.	337.	337.	337.	337.	337.
342.	342.	343.	344.	344.	340.	340.	340.	341.	341.
347.	346.	349.	350.	352.	343.	345.	345.	346.	346.
364.	360.	369.	372.	377.	382.	388.	393.	398.	402.
401.	407.	409.	409.	409.	409.	408.	407.	405.	403.
342.	394.	397.	395.	393.	391.	389.	387.	385.	383.
367.	380.	378.	377.	375.	374.	372.	371.	370.	368.
357.	360.	365.	364.	363.	362.	361.	360.	359.	358.
351.	357.	356.	355.	355.	354.	353.	353.	352.	351.
350.	350.	350.	349.	349.	348.	348.	347.	347.	347.
346.	346.	345.	345.	345.	344.	344.	344.	343.	343.
343.	343.	342.	342.	342.	342.	341.	341.	341.	341.

STAGE

1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0
1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0
1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0	1059.0
1059.1	1059.1	1059.1	1059.1	1059.1	1059.2	1059.2	1059.2	1059.2	1059.1
1059.3	1059.3	1059.3	1059.4	1059.4	1059.4	1059.4	1059.4	1059.5	1059.3
1059.5	1059.6	1059.6	1059.7	1059.7	1059.8	1059.9	1060.0	1060.1	1059.5
1060.3	1060.4	1060.6	1060.7	1060.9	1061.1	1061.4	1061.7	1061.9	1060.2
1062.2	1062.3	1062.4	1062.4	1062.4	1062.4	1062.4	1062.3	1062.2	1062.1
1062.0	1062.0	1061.9	1061.8	1061.7	1061.6	1061.5	1061.4	1061.3	1062.1
1061.1	1061.0	1061.0	1060.9	1060.8	1060.8	1060.7	1060.6	1060.6	1061.2
1060.5	1060.4	1060.4	1060.3	1060.3	1060.2	1060.2	1060.1	1060.1	1060.5
1060.0	1060.0	1059.9	1059.9	1059.9	1059.9	1059.8	1059.8	1059.8	1060.1
1059.7	1059.7	1059.7	1059.6	1059.6	1059.6	1059.6	1059.5	1059.5	1059.7
1059.5	1059.5	1059.4	1059.4	1059.4	1059.4	1059.4	1059.4	1059.4	1059.5
1059.3	1059.3	1059.3	1059.3	1059.3	1059.3	1059.3	1059.2	1059.2	1059.3

PEAK OUTFLOW IS 191. AT TIME 18.75 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	191.	148.	71.	47.	7022.
CMS	5.	4.	2.	1.	199.
INCHES		1.49	3.59	3.72	3.72
MM		37.93	91.10	94.44	94.44
AC-FT		74.	140.	145.	145.
THOUS CU M		91.	173.	179.	179.

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PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIO 1 1.00	RATIO 2 .50	RATIOS APPLIED TO FLOWS RATIO 3 .11
HYDROGRAPH AT	1	.73	1	3619.	1810.	398.
	(	1.90)	(	102.48)(	51.24)(	11.27)(
ROUTED TO	1	.73	1	3584.	1792.	191.
	(	1.90)	(	101.50)(	50.75)(	5.41)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 ....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	1059.0	1061.60	1064.50
STORAGE	336.	396.	454.
OUTFLOW	0.	131.	743.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	1065.80	1.30	483.	3584.	0.00	17.00	0.00
.50	1065.13	.63	468.	1792.	5.25	17.00	0.00
.11	1062.83	0.00	409.	191.	0.00	18.75	0.00

APPENDIX G

CORRESPONDENCE

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202

IN REPLY REFER TO
ORNED-G

13 March 1981

Keith McCord
Route #7
Maryville, Tenn. 37801

Dear Mr. McCord:

As provided under authority of the National Dam Inspection Act, Public Law 92-367, all non-Federal dams in Tennessee must be inspected for the purpose of protecting human life and property. According to our records, you are the owner of Lamert Dam, located in Blount County, Tennessee.

An inspection of this dam is scheduled for 21-23 April, 1981. Engineers from the Engineering Division of the U.S. Army Corps of Engineers in conjunction with the Tennessee Division of Water Resources will conduct the inspection. As the owner we encourage your participation in the inspection. Following this inspection a report will be prepared and a copy forwarded to you.

If there are any questions or a need for additional information, please contact Mr. Paul Bluhm or Mr. Timothy McCleskey at 615/251-7366.

Sincerely,

E.C. MOORE
Chief, Engineering Division

ORNED-G

NON-FEDERAL DAM INSPECTION REVIEW BOARD
PO BOX 1070
NASHVILLE, TENNESSEE 37202

Commander, Nashville District
US Army Corps of Engineers
PO Box 1070
Nashville, TN 37202

1. The Interagency Review Board, appointed by the Commander on 19 June 1981, presents the following recommendations after meeting on 27 August 1981, to consider the Phase I investigation report on Lambert Dam located near Maryville, Tennessee.

2. The toe drains should be periodically checked for deposition of material. If significant deposition is occurring, the owner should engage the services of a qualified engineer to determine the cause of the deposition.

3. Recommendation c. should be changed to allow cattle grazing on the dam; this grazing should be controlled to minimize damage to the embankment.

4. The progression of the erosion of the wave berm should be periodically checked.

5. The Board is in agreement with other report conclusions and recommendations following minor revisions.

FRANK B. COUCH, JR.
Chief, Geotechnical Branch
Chairman

BOBBY G. MOORE
Assistant State Conservation Engineer
Alternate, Soil Conservation Service

EDMOND B. O'NEILL
Alternate, Division of Water Resources
State of Tennessee

THOMAS ALLEN
Hydraulic Engineer
Alternate, Hydrology and Hydraulics Branch

EDWARD B. BOYD
Hydrologic Technician
Alternate, US Geological Survey

JAMES GUNNELS
Structural Engineer
Alternate, Design Branch

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
P. O. BOX 1070
NASHVILLE, TENNESSEE 37202

IN REPLY REFER TO

11 AUG 1981

ORNED-G

SUBJECT: Report of Phase I Investigation of Lambert Dam, Maryville, Tennessee.

Commander, Ohio River Division
ATTN: ORDED-T (Griff Ray)

1. Inclosed are three copies of our draft report covering the Phase I investigation of Lambert Dam in Blount County, Tennessee.

2. The report is still in draft form at this time. Request return of copy containing color photographs along with your comments. We will furnish you a final version of the report when it is completed.

FOR THE COMMANDER:

E. C. MOORE
Chief, Engineering Division

1 Incl
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CORPS. OF ENG

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TO CDRUSAED NASHVILLE TN //ORNED-S//

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SUBJ: PHASE I INSPECTION REPORT, LAMBERT DAM, BLOUNT COUNTY, TENNESSEE THE INSPECTION REPORT AND RECOMMENDATIONS ARE SATISFACTORY SUBJECT TO THE FOLLOWING COMMENTS.

A. THE REPORT SHOULD RECOMMEND THAT THE EMERGENCY DISCHARGE GATE SHOULD BE PERIODICALLY OPERATED TO INSURE THAT IT IS FUNCTIONAL AND CAN BE RELIED UPON IN CASE OF AN EMERGENCY SUCH AS THE ONE IN OCTOBER 1963.

B. CONCUR WITH THE RECOMMENDATIONS TO INSPECT THE DAM DURING A DRY PERIOD TO DETERMINE IF THE WET SPOTS ON THE DOWNSTREAM EMBANKMENT SLOPE ARE A RESULT OF SURFACE WATER OR THROUGH SEEPAGE. THE RECOMMENDATIONS SHOULD, HOWEVER, BE EXPANDED TO STATE THAT IF SUCH AN INSPECTION DOES NOT CONFIRM THE WETNESS TO BE THE RESULT OF PRECIPITATION, THE DAMS SHOULD HAVE THE STABILITY OF STRUCTURE REVIEWED BY A QUALIFIED ENGINEER.

C. APPENDIX F, PAGE 1. THE PMP CANNOT BE OBTAINED FROM TP 49 AND THE NUMERICAL VALUES FOR DEPTH OF OVERTOPPING AND DURATION OF OVERTOPPING APPEAR TO BE TRANSPOSED. APPROPRIATE CHANGES SHOULD BE MADE.

BT
UNCLAS

SENT 1 PLS ACK TO
JR SACSGDIST NVL
P

DIST ENGR	COMPT	EEO	ADMIN SVC ✓	CONST
DEP DE	AUDIT	PAO	PROG DEV	ENG ✓
DEP DE TTW	ADP	COUNSEL	PERS	OPER
EX ASST ✓	SEC MGR	SAFETY	PROC & SUPPLY	

ORNED-G (11 Aug 1981) 2d Ind
SUBJECT: Report of Phase I Investigation of Lambert Dam, Maryville, Tennessee

DA, Nashville District, Corps of Engineers, PO Box 1070, Nashville, Tennessee 37202

TO: Commander, Ohio River Division, ATTN: ORDED-T (Griff Ray)

1. 1st Indorsement, paragraph A. Concur. This recommendation has been added to the report.

2. 1st Indorsement, paragraph B. Concur. This recommendation has been added to the report.

3. 1st Indorsement, paragraph C. The PMP can be obtained from TP 40. This has been resolved by telephone between Tom Porter, Hydrology and Hydraulics Branch, Nashville District, and Tom Liggitt, Hydrology Section, Ohio River Division.

An error was made in computing the depth and duration of overtopping in the preliminary report, but the correct values are present in the final report. There was a significant change in these values which resulted in a change in the condition classification from "unsafe-nonemergency" to "significantly deficient." See attached sheet for definitions of these terms. It was felt that the depth and duration of overtopping was not enough to cause failure of the dam and, therefore, should be called significantly deficient.

FOR THE COMMANDER:

W. K. Eastland

1 Incl
as

E. C. MOORE
Chief, Engineering Division
FOR

DEFINITION OF CONDITION CLASSIFICATION

"Unsafe - Emergency" - A dam in a state of imminent failure. State and local authorities and downstream residents should be advised immediately. Downstream residents may have to be evacuated, remedial work should begin immediately, the reservoir should be drawn down or drained, or combination of the above (e.g., advanced piping, major slope instability, recent sudden collapse of a portion of the foundation, imminent overtoppint, etc.).

"Unsafe - Nonemergency" - A dam with obviously serious deficiencies which could clearly and rapidly develop, or are developing, into failure modes, but do not yet pose the threat of imminent failure. State and local authorities should be advised promptly and remedial work should begin as soon as practical. Someone whould be assigned to periodically check on the dam's condition until remedial work is begun. Drawing down the reservoir should be considered, (e.g., flowing seepage from embankment which could lead to piping, evidence of solution channels or cavitation in the foundation, seriously inadequate spillway capacity as per ETL 1110-2-234, history of recurring slope instability, etc.).

"Significantly Deficient" - A dam with deficiencies which, if left unchecked, would likely become serious deficiencies and could ultimately result in failure. Advise State authroities and recommend remedial work be scheduled in time to prevent substantial further deterioration of the condition(s) - usually within 6 months to a year or sooner (e.g., heavy growth of sizeable trees on slopes, potentially serious erosion, spillway discharge channel too close to embankment, etc.).

"Deficient" - A dam with deficiencies which need attention, but which would not likely affect the safety of the dam unless left unchecked for a long period of time. Advise State authorities and recommend remedial action at owner's convenience, but before problem can escalate into a significant deficiency (e.g., brush and/or few or very small trees on embankment, long term deterioration of masonry or metal outlet features, formation of deep ruts in embankment roadway, deterioration of riprap,etc.).

"Not Deficient" - Well constructed and maintained dam with no apparent deficiencies relative to its safety and structural integrity.

APPENDIX H

PREVIOUS INVESTIGATIONS

TVA 64 (08-4-59)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : Edwin H. McCain

FROM : William P. Clark

DATE : October 18, 1963

SUBJECT: LAMBERT DAM FAILURE - BLOUNT COUNTY, TENNESSEE

On October 17, 1963, a field investigation was made of the subject dam which had failed on October 12. This investigation was made to try to determine the cause or causes of this failure.

No visible signs could be found that would indicate that muskrats had been working in the dam fill in the vicinity of the wash out or elsewhere for that matter. The soil in the lake area appeared to be very conducive for crawfish but no signs of these were found either.

The concrete pipe, 24-inch concrete, which formed the spillway discharge culvert showed no visible signs that seepage rings had existed on this pipe, neither were any seep rings found among the various pieces of pipe scattered below the dam. The pipe had been laid on a concrete cradle throughout the width of the dam but again there were no signs of seep rings on these portions of the cradle that were found washed out and/or still in place.

The morning glory type of spillway entrance to the 24-inch pipe consisted of a vertical square concrete box, constructed in sections, which sections appeared to have not been banded together. There was no means of controlling the discharge through this spillway, the discharge varying according to reservoir height over the intake.

There was no other spillway other than the one mentioned above. However, there did exist through the dam, a 6-inch pipe with a screened inlet on the lake end and a valve at the downstream end. This pipe was used to furnish water for irrigation purposes. From talking with the farm manager, Mr. Hoffstetter, the 6-inch pipe was at an elevation approximately 10 feet higher than the 24-inch pipe.

The first leakage was noticed on the downstream side of the fill at an elevation about 10 feet higher than the 24-inch pipe, however, the farm manager could not remember whether or not it was at/or near the 6-inch pipe outlet.

In summing up the possible causes of the dam failure, it appears that it could have been any of the following reasons or a combination of them:

(1) Settlement of the earth fill could have broken the 6-inch pipe at a joint or joints, causing water to seep out into the earth fill. (The water in this pipe being under pressure at all times, since the valve was on the outlet end.)

TVA 64 (08-4-59)

UNITED STATES GOVERNMENT

Memorandum

TENNESSEE VALLEY AUTHORITY

TO : Edwin H. McCain

FROM : William P. Clark

DATE : October 18, 1963

SUBJECT: LAMBERT DAM FAILURE - BLOUNT COUNTY, TENNESSEE

(2) Settlement could have caused a break in the 24-inch concrete pipe creating a leak in it.

(3) Lack of seepage rings around the 24-inch and also the 6-inch pipe.

(4) And least likely of all, possibly some help from muskrats.

William P. Clark

WPC:JQM
CC: Melton D. Cauthen

(a) Looking upstream on Six Mile Creek from Montvale Road. Note wash and highwater marks 2300 feet downstream from Lambert Brother's Dam.

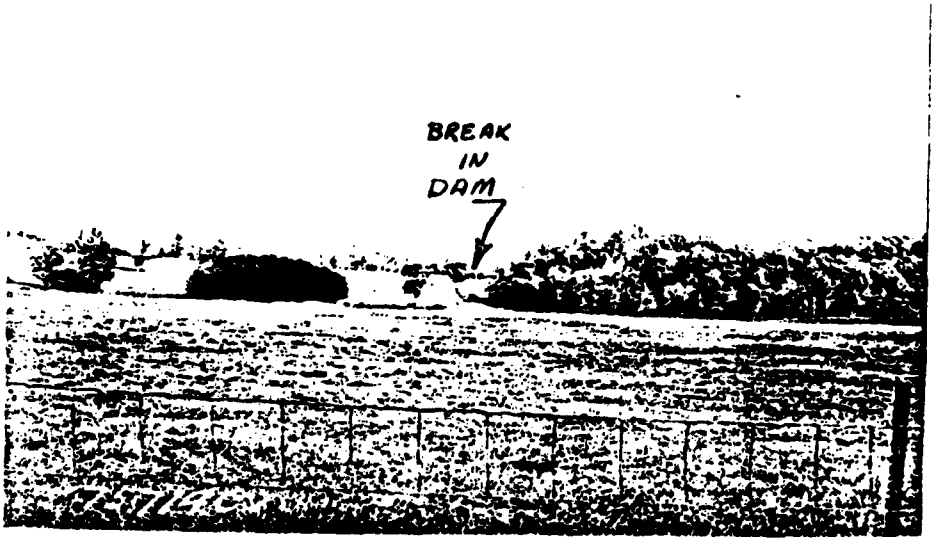
(b) Looking upstream and towards Six Mile Creek from the left bank, upstream of Montvale Road.

LAMBERT BROTHER'S DAM

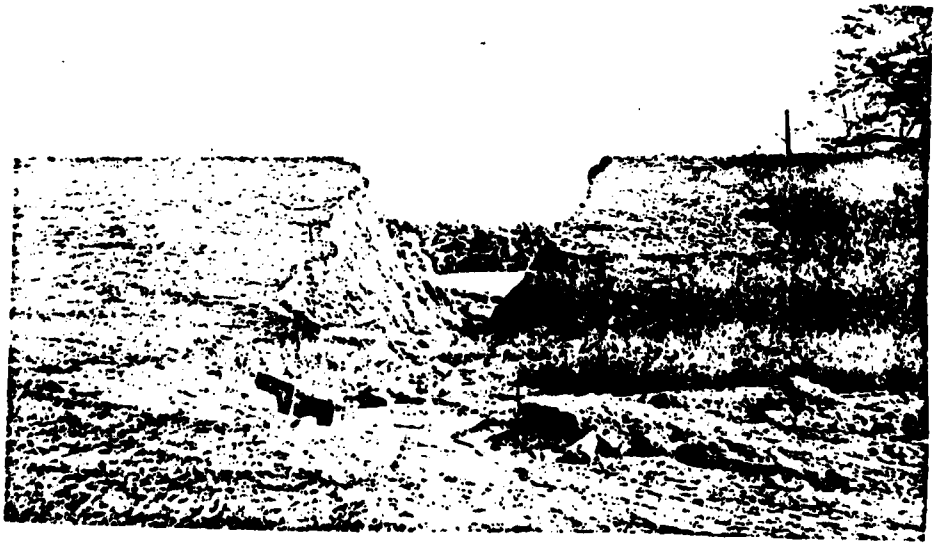
TRIBUTARY OF SIX MILE CREEK

BLOUNT COUNTY, TENNESSEE

Photo by [illegible]



(c) Looking east and upstream at break in dam, center background, from Montvale Road.

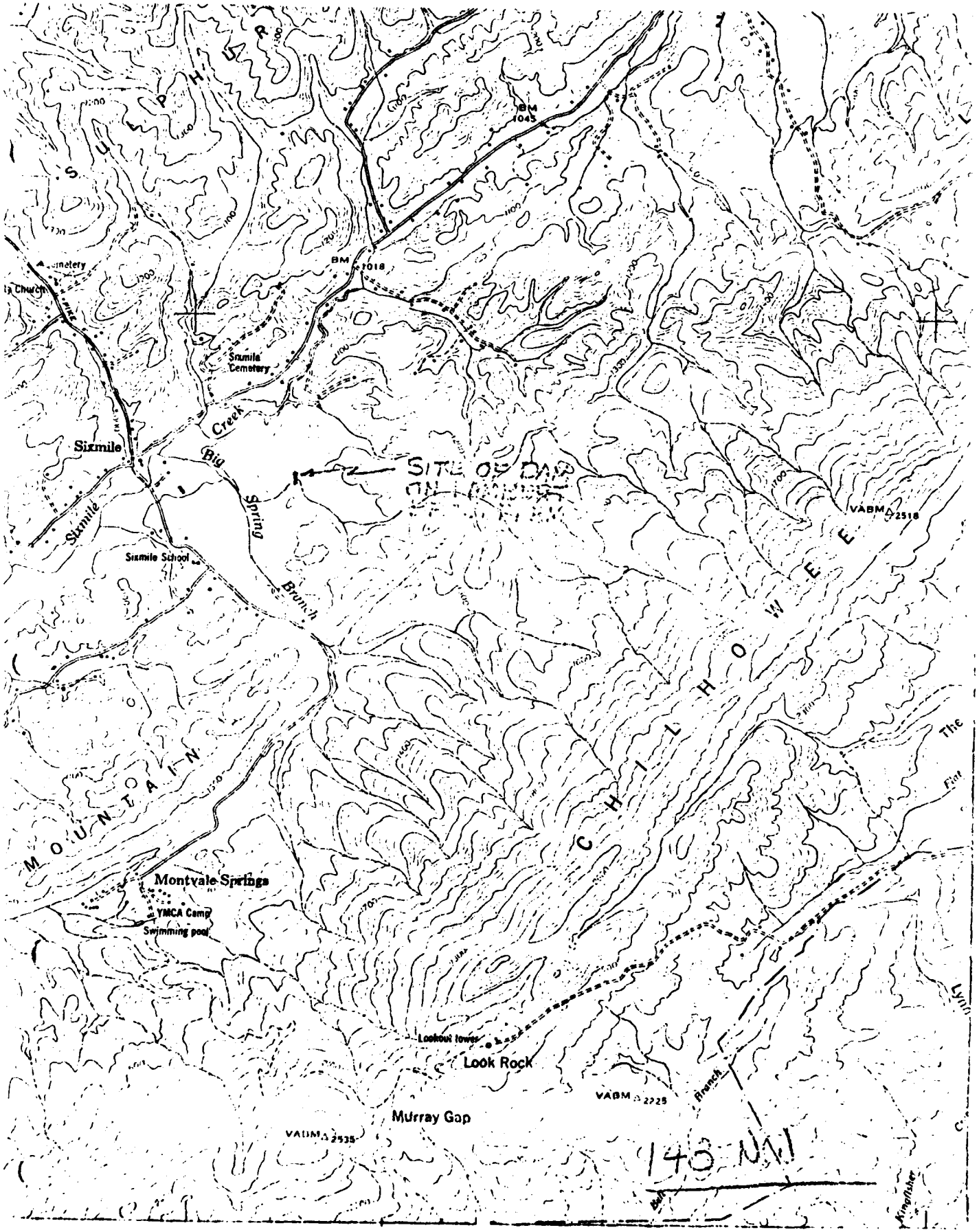


(d) Looking upstream at break in dam. Note a portion of vertical morning glory type overflow section at left center.

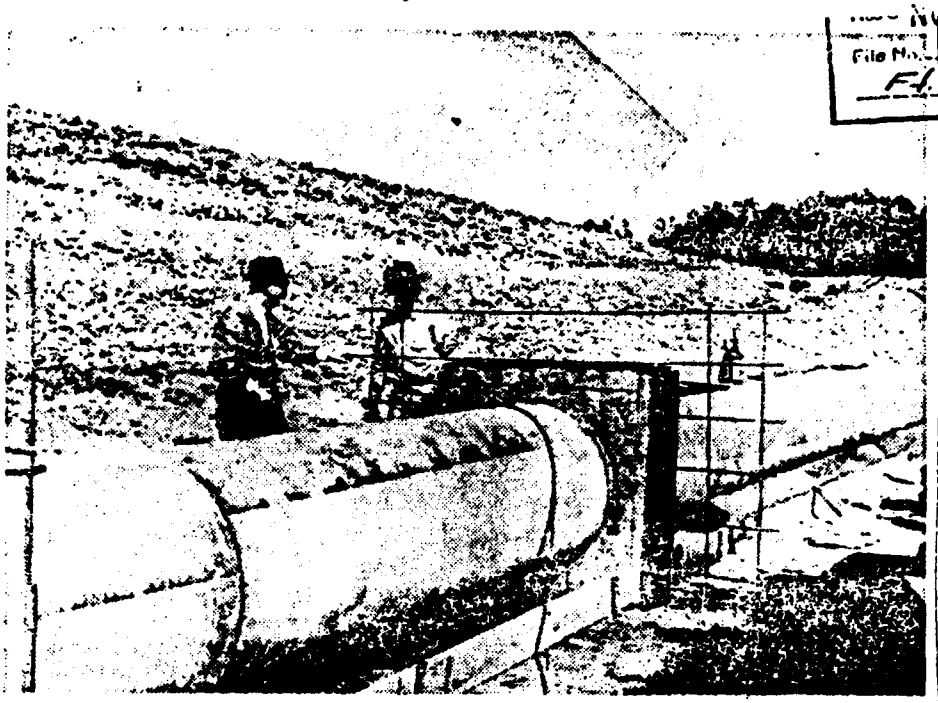
(e) Close-up view of break in Lambert Brother's Dam as seen from downstream.

(f) Close view of dam cross section looking towards the left bank, south end of dam. Note slide on upstream slope.

(g) Looking from the top of the Lambert Brother's Dam at the break on the upstream side and remaining pool.


SUPHER
BM 1045
BM 1018
Cemetery
Church
Sixmile Cemetery
Creek
Sixmile
Big Spring Branch
SITE OF DAM
Sixmile School
VABM 2518
CHILHOWEE
MOUNTAIN
Montvale Springs
YMCA Camp
Swimming pool
The Flat
Lookout tower
Look Rock
VABM 2725
Murray Gap
VABM 2535
Lynn
Kingfisher
140 NW

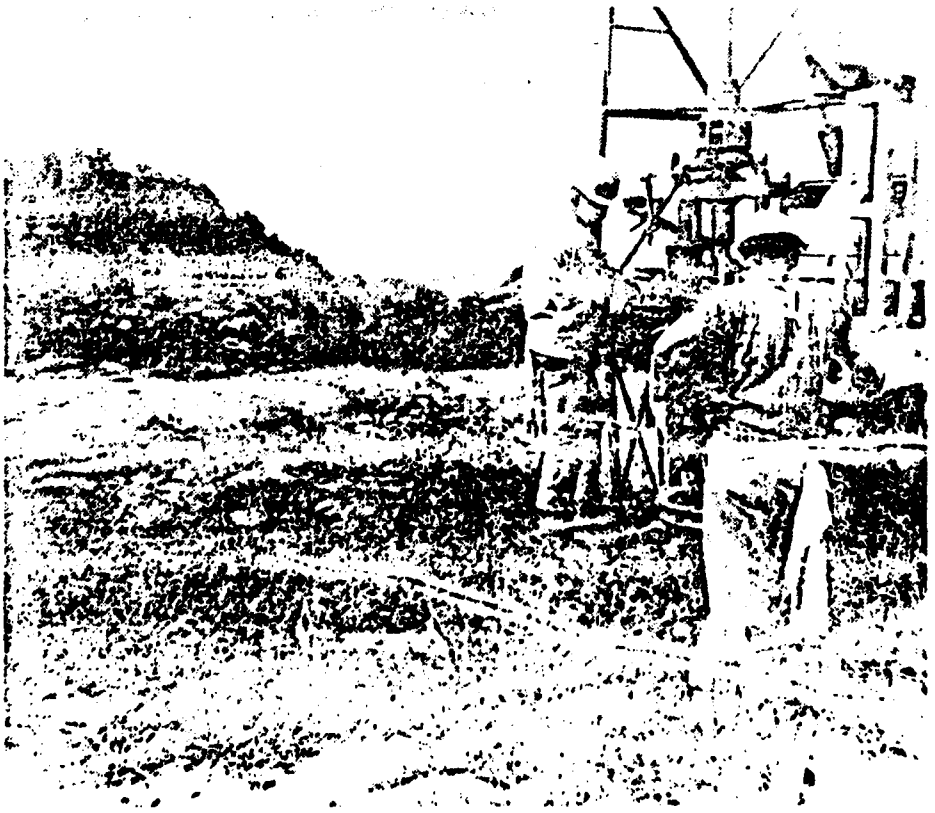
Maryville, Tennessee
November 12, 1964



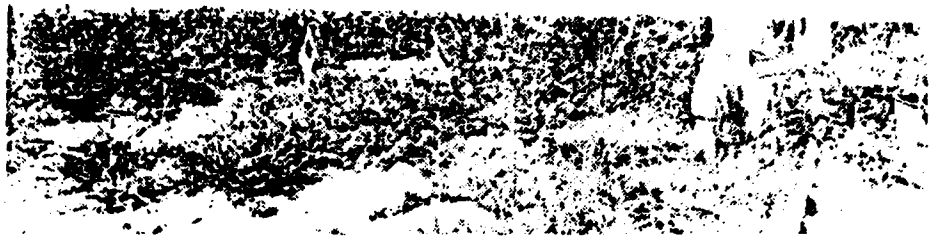
Tying Steel On Anti-Seep Collars

J. B. Lambert gives first hand supervision to tying of steel in one of the 18 concrete anti-seep collars on the Lambert Farms Dam being reconstructed in the Six Mile Community. A concrete cradle is also being poured to support the pipe from below.

- Blount Soil Conservation District Photos



Drill Crew Gets Rock, Soil Samples



Drill Crew Gets Rock, Soil Samples

Soil Conservation Service drill crew investigates borrow area to a depth of 15 feet. Samples of rock and soil were also taken from the spillway foundation area.

Lambert Dam Being Rebuilt, Improved

"Everything we're doing to our dam will make it better than before," says J. B. Lambert as he watched the work progress along the center line of his dam. "We're putting in the best pipe available. It's been tested under 20 feet of head and it doesn't leak a drop. The six inch pipe, thought by some to have caused the break in our previous dam, is left out completly."

The Lambert dam, at Six Mile, is being rebuilt by the most rigid of standards. Every part is being double checked and additional safety measures installed. Borrow areas were sampled and tested to determine suitability and desired compaction and are being put in according to the results of these tests.

Last spring the dam developed a small leak, which eventually led to a break, in the dam and completely emptied the lake, damaging some of the Lambert farm.

The reservoir itself is being improved by deepening the shallow areas and by filling in the deeper areas. This should help eliminate some of the waterweed growth as well as generally improve fishing.

Aside from this, a cold water release is being installed as part of the spillway that will remove the normal overflow from the bottom of the lake rather than from the top. Water at the bottom is usually colder, contains less fish food and is lower in oxygen content than water near the top of a lake.

The first shipment of fish are to arrive for stocking this lake early in December. The fish on order for stocking are bluegill, shell crackers, channel catfish and largemouth bass. The bass will be stocked in May 1965 after the bluegill have had time to spawn.

Another feature included in the new dam is a drain at the top of the dam to collect any seepage that may occur. The dam is also 20 feet wider at the base. It is now 320 feet wide.

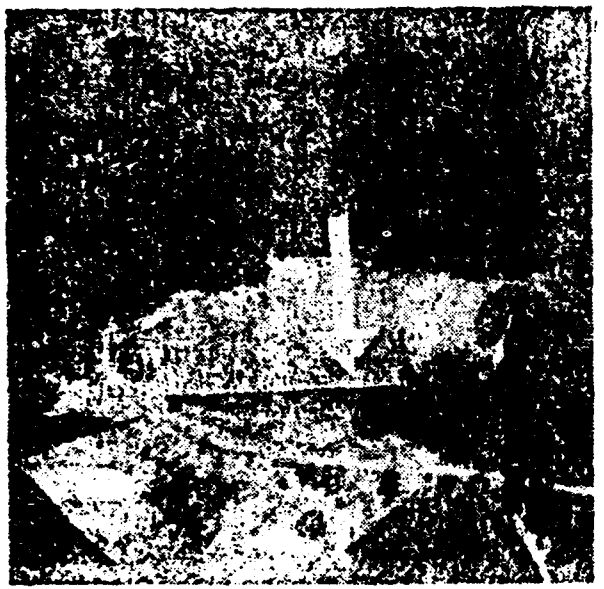
The lake has been expanded to a full 20 acres by excavation along the edges to get fill material. The slopes at the edges have all been sloped to at least the three-to-one that is to be desired.

Lambert Brothers is planning a rigid fertilization program for the lake beginning early next spring. They realize that fertilization is as necessary to getting full fish production as it is to getting full production of field crops.

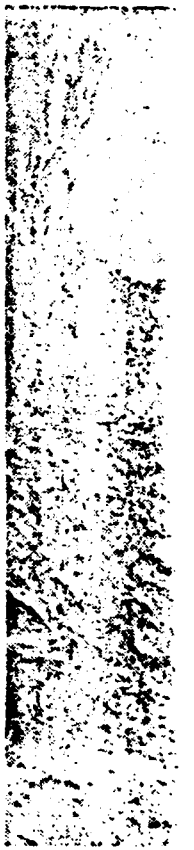
This dam is being constructed with engineering assistance through the Blount Soil Conservation District as a regular part of its technical assistance to farmers.

Bryville
October 1

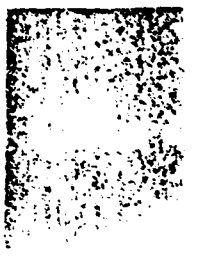
Break In Large Farm Dam Brings Fi



WHERE DAM BROKE — Arrow in aerial view (left) by Soil Conservation Service shows point where break occurred Saturday night in dam on Lambert Brothers farm. Large sycamore tree near point of arrow was swept away by the water. At right is view from behind dam after the break in background. two men, tiny specs near dam (background) were picking up fish. When water receded, tracks made seven years ago by heavy machinery grading the bed of the lake were still visible. Also noticeable were many small "dimples" in the lake floor where Blue Gills had made their nesting areas.



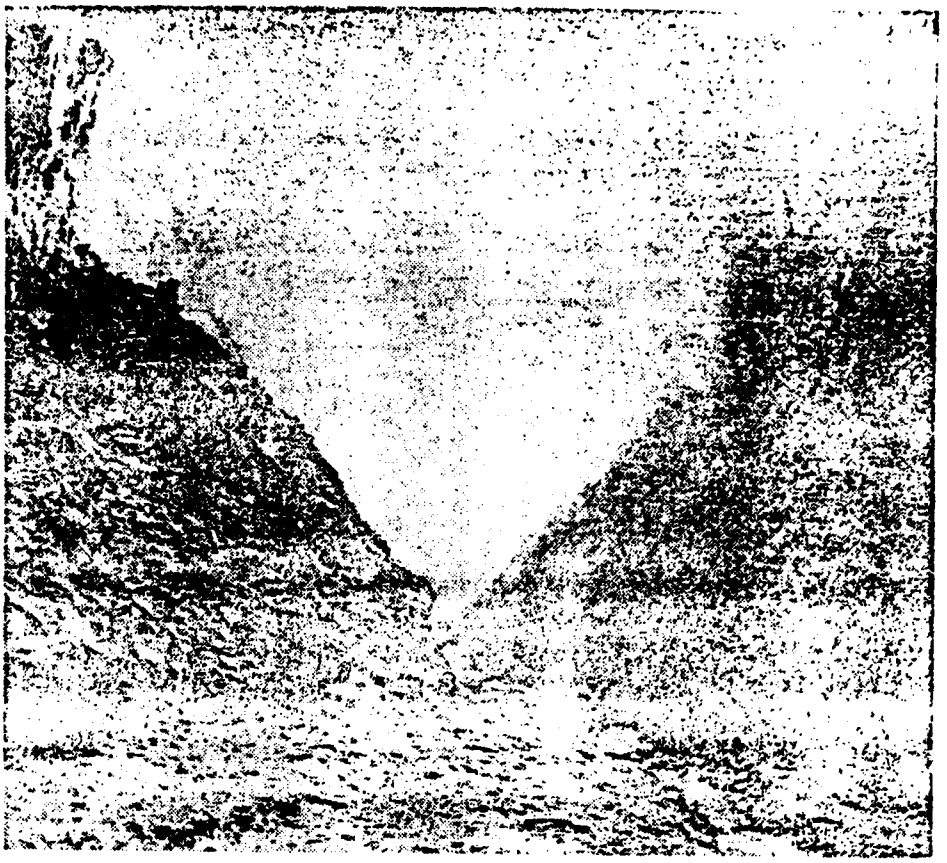
BREAK IN DAM
at the 17-acre lake



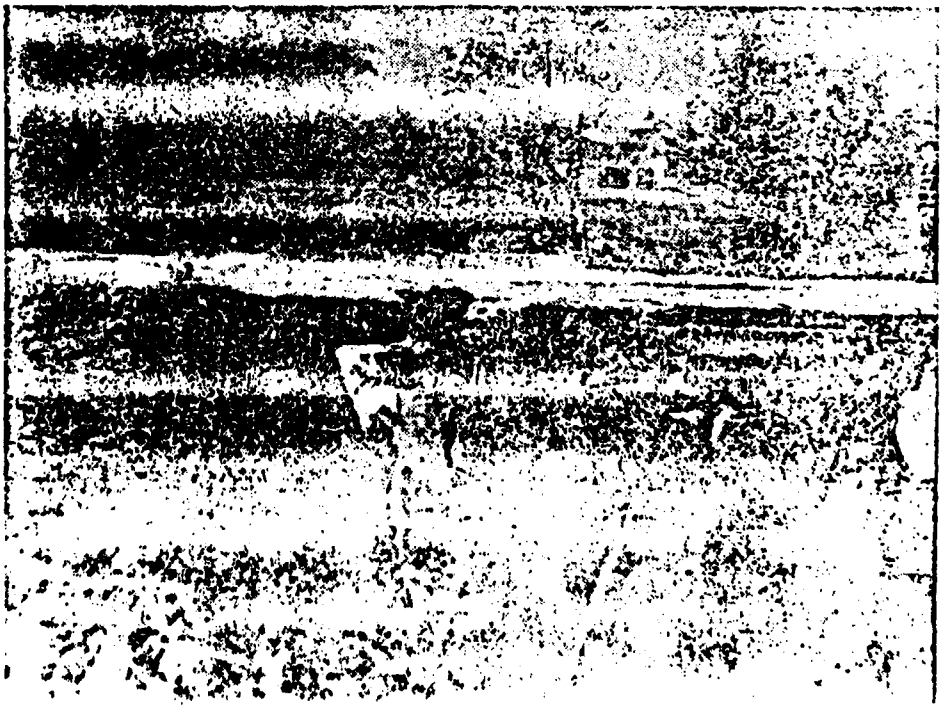
October 14, 1963

am Brings Flood Of Visitors

hinery grading the bed of the lake were . Also noticeable were many small "dim- e lake floor where Blue Gills had made g areas.



BREAK IN DAM — About 35 feet wide at the top is this break in the 47-foot high dirt fill dam at the 17-acre lake on Lambert Brothers farm at Six Mile on Montvale Road.



ROAD DAMAGE — Some washout damage occurred at this bridge on Six Mile Creek on Montvale Road at Six Mile Community. New blacktop pavement was floated loose from base and settled backdown on limb which had washed under it. Between trees may be seen overturned pick-up truck in background. Truck was washed from road in foreground some 75 yards into the field and overturned.

— Times Staff Photos — Stone

78 Million Gallons — — Through The Dam

Lambert Dam At Six Mile Breaks

Enough water to supply the City of Maryville's needs for two months swept across the Six Mile area on Montvale Road Saturday night when the dirt fill dam on Lambert Brothers Farm broke.

No one was injured and there was no serious damage except to the dam and the Lambert fields which were covered with mud and rocks deposited by the water.

Cause of the break has not been determined but Soil Conservation Service Engineers from Knoxville and Nashville are expected to examine the dam this week to attempt to determine the cause and to suggest methods for repairing the damage.

While muskrats had been seen in the lake and around the dam, there had been no indication that they caused the leak that resulted in the break in the dam. However, muskrats are one of the biggest enemies of such dirt fill dams and could have caused the damage.

Completed in 1957, the 17-acre farm lake was one of the biggest of its kind in the state at the time it was built. Considered a $40,000 to $50,000 project, the 538 foot long dirt fill dam contained 12,000 cubic yards of dirt and was 47 feet high. The lake, which was full when the leak was discovered, contained, 240 acre feet of water (78,408,000 gallons). In places the water was 40 feet deep and included drainage from 327 acres.

Well stocked with Blue Gills and Largemouth Bass, the lake was one of the best fishing spots in the county. This past spring it was not unusual to see catches weighing five pounds.

Elmer Lambert, one of the owners, said he expected the dam would be repaired in the near future.

Many area residents were at the scene Saturday night. By 7:30 a.m. Sunday approximately 50 persons were on hand, curiously eyeing the damage from such an unusual event. Lambert estimated that as many as 1,000 persons were scattered around the farm area by midafternoon Sunday to get a closer look at the damage.

A small leak in the dam was discovered about 6 p.m. Saturday by Ben Grindstaff who lives on the farm on the banks of the lake. The hole increased in size and about 9 p.m. a cave-in occurred in the dam above the leak and the water ripped through a 35-foot wide hole, emptying the lake in about an hour.

Grindstaff said that when he first discovered the leak it wasn't over four inches across. He added the water was just boiling up like a spring out of the dirt face of the dam. A little later, he spotted a large swirl in the lake between the top of the dam and a vertical overflow pipe out in the lake, indicating a large amount of water was draining out of the lake. However, the stream coming out the lower side of the dam at that time was no larger than six or eight inches.

The hole increased in size until the stream was as large as a creek. After about three hours, the water level had dropped only about a foot. The top of the dam then caved in with a loud rumble, Grindstaff said. The cave-in threw water 30 feet into the air, Grindstaff added. He was standing on top of the dam a few yards from the cave-in and was sprayed with the water thrown into the air.

The water from [illegible]

68,408,000
the water

til the stream was as large as a creek. After about three hours, the water level had dropped only about a foot. The top of the dam then caved in with a loud rumble, Grindstaff said. The cave-in threw water 30 feet into the air, Grindstaff added. He was standing on top of the dam a few yards from the cave-in and was sprayed with the water thrown into the air.

The water from the dam followed roughly the low area along Six Mile Creek into which overflow from the lake drains. About half a mile downstream, where the creek goes under a concrete bridge on Montvale Road, the water covered the road to a depth of five or six feet.

Two youths narrowly escaped injury when their pick-up truck was swept from the road 75 yards downstream into a field and turned on its side. They climbed onto the side of the new pick-up truck and were rescued by Blount County Rescue Squad. Larry Lambert, driver of the pick-up truck, and Milton Dickenson were the two rescued. They had heard about the leak in the dam and had gone over to look at it. They had been warned of the danger but delayed too long in leaving the area.

Six Mile Baptist Church also received some damage. Water covered the church parking lot, reaching almost to the floor level of the sanctuary. The basement, where the oil furnace is located, was flooded. The water also swept the outside oil tank supplying the furnace from its foundation, spilling its contents. One of the church's outdoor toilets was also washed away.

At the point where Montvale Road crosses Six Mile Creek, the water floated the fresh blacktop loose from the road bed. As the water went back down, the blacktop settled back into place. In one spot it settled down on a limb that had been washed between the blacktop and the roadbed.

Old Piney Road, northeast of Six Mile, was flooded in several places within a short distance from the Montvale Road intersection.

Sheriff Roger Trotter set up road blocks around the flooded area. Area residents were warned of the impending danger and left their homes in the event the water should flood any homes. However, no homes were seriously threatened.

Long sections of the three-foot in diameter concrete pipe, used as the overflow for the lake, were scattered like match sticks as far as half a mile below the dam. A large sycamore tree near the break in the dam was swept aside like a splinter. The water left heavy deposits of silt

Sunday morning area fishermen were wading in the mud and small pools of water along the route of the water from the well-stocked lake, stringing up fish. Cracks were visible in the top of the dam near the break. The cracks apparently resulted from the impact of the cave-in.

A number of prominent persons have fished on the private lake. Among them was the late United States House of Representatives Speaker Sam Rayburn of Texas. He fished on the lake in July 1961 while he was here for the dedication of the bridge across Fort Loudoun Dam, shortly before his death.

The Lambert dam was designed by the United States Department of Agriculture's Soil Conservation Service through the Blount County Soil Conservation District. Tillman E. Lee, now in Columbia, was work unit conservationist at the time it was built. Because of the unusual height of the dam, plans were sent to the regional office in Spartanburg, S. C., where they were approved.

Dewey Simpson, present work unit conservationist, stated that it was the first time he had ever known of a dirt fill dam breaking when it had been built in accordance with basic engineering standards. Observing the layers of construction at the point of the break in the dam, he said that from all indications the layers of dirt were put in place and packed in complete accordance with the best known procedures.

The break came above two pipes running through the base of the dam. One was a three-foot in diameter concrete overflow pipe. The other was a six-inch iron pipe. A vertical concrete box standpipe in the water near the dam automatically took care of the overflow when the lake reached full stage, draining it through the overflow pipe in the base of the dam. The iron pipe had a valve on the lower side of the dam and was installed so irrigation pipe could be hooked directly to it for irrigation of the farm.

Two other theories have been advanced as to the possible cause of the break. One is that sweating of the overflow pipe during the six-year period could have wet the soil through the dam and eventually led to a wet spot and then a leak. A wet spot had been noticed in the dam recently but it was not close to the break. The other theory is that the iron pipe, which had water pressure on it at all times, could have been broken or began leaking and eventually caused a leak in the dam.

Small Dam Collapses On Farm Near Maryville

MARYVILLE, Tenn. (AP) — An earthen dam impounding about 15 acres of water slowly gave way and collapsed near here Saturday night as rescue workers and police stood by with emergency equipment.

The flow of water washed a truck off a road and against a tree, and its two occupants had to be rescued by boat.

But fears for the safety of some two dozen homes below the dam eased with the gradual disintegration of the dam.

The dam is located above a creek four miles southeast of here. It was a structure 70 feet high, 200 feet wide and 60 feet deep.

James Kagley, jailer at the Blount County sheriff's office, said there would be "real trouble" if the dam broke.

"We're calling people by phone right now, telling them to abandon their homes," he added. "We are trying to round up boats in case they're needed."

Police said from one to two dozen homes are located along the six mile creek below the dam in the Chota community.

The estimated 100 men, including about 75 members of the Blount County rescue squad, were on the scene with floodlights and other rescue equipment.

KINGSPORT NEWS

OCT 13 1963

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